





since 1893

Condor Pressure Control

Controls & Solutions

... the inventor of the pressure switch



Over 120 years Condor

Enthusiasm and competence over four generations



The best of inspiration, innovation and craftsmanship

The company Condor was founded by August Frede in 1893, and first after its founding, it dealt with centrifuges, milking machines and also later pumps. With the issue of the world's first patent for a membrane pressure control for the automatic control of pumps in 1935, the era of Condor switching devices began.

Also the brand name MDR dates back to this time.

As the years continued, the product portfolio expanded constantly. Alongside motor protection relays and float switches, CPC offers through their own switch design and also customer-specified switching solutions of all types, for example pump and compressor controls, motor start-up controls or customer-specified special solutions.

As the "inventors of the pressure switch", all employees feel committed to the long and successful tradition of the company. Without a continuous, innovative and qualitative further development of our products, this persistently successful track record would not have been imaginable.

Condor itself was already certified according DIN ISO 9003 in 1993 and according to DIN ISO 9001 in 1995. This likewise has applied for CPC since its founding as an independent limited company. The basis for all of our handling and thoughts are these high demands for quality, which are to be optimized daily.

As customers of ours, you can consult our excellently qualified employees at any time. It does not matter whether your concerns are of a technical or commercial nature.

A symbol for quality since 1893.





Condor - our strengths

Competence · Efficiency · Reliability · Flexibility



Competent

Industrial pressure technology from 0.9 bar up to 250 bar

Condor has both in terms of price and technology the most suitable pressure switch:

- OEM or high-end product
- Standard product or customer-specified solution

Value for money

Pressure technology at its highest level

The concentration on pressure switches as components has led to an extraordinary efficiency and a perfect value-for-money ratio.

Reliability

Predictable delivery times and consistently meeting scheduling requirements

For short delivery times and binding delivery schedules, also for special designs, Condor is your predictable partner.

Condor reduces as a result your storage needs and increases your productivity.

Flexible

Solutions for your individual requirements

We solve your problems in industrial pressure technology quickly and cost-consciously, not only for mass-produced series, but also for small and mid-sized quantities.

Whether you need technical support, quick service help or rush orders, flexibility at Condor is an advantage for you.

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High performance pressure switches for AC currents

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Our **Condor** Sales team



Finding the solution for your problems is our top priority.

Our team can advise competently about all possibilities for a solution for your existing problems as well as delivery dates, times and prices. Simply contact us. We support you purposefully and professionally with realization

of your project according to your requirements. Individual solutions for the field electronic controls are a further component in our service programme.



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Operating under the slogan, **CONTROLS & SOLUTIONS ...**

customers can get everything from a single source – from switching devices to system solutions – completely tailored to their needs. Already during the development of new product range and variations, prototypes are subjected to early intensive, mechanical and electric lifetime tests on our own testing stations. Even during the product life cycle, all of our products are continuously tested to ensure that your performance requirements are being met.

Many of the needed parts are produced in our own production and, therefore, are subject to our quality monitoring all the way through the whole supply chain.

Design changes and optimization of the needed tools can be quickly and efficiently realized in our own tool-making department. Furthermore, we only work together with long-standing and sought-after suppliers.

A certification is for us the most fundamental requirement in the selection of suppliers.

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Condor

Industries and applications



Your individual wishes

You will benefit from our long-standing experience in various industries, which is also reflected in our products. Therefore, we are the right partner for your individual wishes.

With our long-term know how of below-mentioned example fields of application, we will gladly find the optimal solution also for you and your special application area.



Compressors

- In the field of pressure controls and switches, Condor offers the complete assortment and has been number 1 in Germany as well as in Europe for a long time. The tried and tested MDR series as well as the electronic pressure controls represent reliability and competence.
- The high quality of pressure controls is continuously confirmed in extensive tests, for example lifetime and vibration tests.
- For use with direct, alternating and rotary current application up to 15 kW.
- For a coordinated cooperation between several compressors, Condor offers standardized compressor controls and as well as customer-specified special solutions.
- Continuous further development and even newer customer-specified solutions help you in the completion of new projects.
- Switches possess various approvals, for example VDE, VDS, ATEX, GL, KEMA, CSA or UL.



Condor products

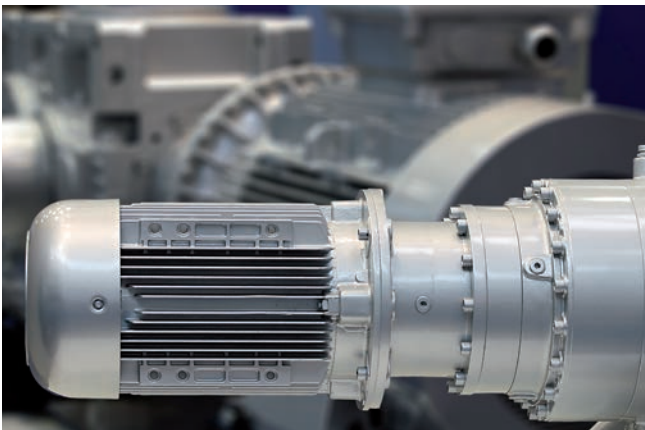
- individual and versatile

Industries



Water management / pumps level control

- For the field of water technology, Condor is the problem solver. We point out possible solutions and build customer-specified complete solutions for you and in line with your demands.
- Electronic level control as well as electronic pump controls (in connection with float switches for pumps) guarantee for the highest possible degree of certainty in monitoring fill levels or in filling up and pumping dry.
- Along with electronic devices, we offer a wide range of electro-mechanical pressure switches with the most various choice of membranes, connector materials and higher IP protection types.
- With our pump controls, we can offer you standardized devices for the field of wastewater management, for example in wastewater pump systems, ducts and pumping stations.
- Controls possess various approvals, for example VDE, VDS, ATEX, GL, KEMA, CSA or UL



Motor technology

Our entire motor-protection switch programme for use in all industrial areas becomes a successful complete range through its versatile accessories.

Beyond that, we are able to offer customer-specified motor start-up controls by using our own internal control system design.



Fire protection extinguishing systems

- VdS pressure controls are designed primarily for use in stationary water-based extinguishing systems.
- The high quality of pressure switches is constantly proven through demanding tests, for example salt-spray corrosion tests or water hammer tests.
- Pressure switches have been approved by VdS Schadenverhütung GmbH under the approval numbers G4090032 and G4090008. Following pressure ranges can be used: 0.35-1 bar, 0.7-10 bar, 1 – 12.5 bar and 1.0 – 16 bar.
- As VdS recognized production sites, we are able to manufacture a variety of possible customer-specified variations, for example with a reset function, with plastic flanges or with Viton membranes.
- Upon request, customer-specific circuit boards with specified wiring and LED displays in an integrated design are available and realizable.



Condor

Industries and applications

Industries



Shipbuilding / offshore

- GL pressure controls, with a pressure range up to 250 bar, have been approved by Germanischer Lloyd, one of the largest classification societies, under the approval number 86884-10 HH.
- All GL pressure switches can be equipped with a reset function in order to ensure the realization of maintenance work.
- Monitoring pressure of fluids and gases in pipelines, boilers, pressure tanks and devices. In addition for automatic operation of compressor and pump motors, for example for water supply, with addition pumps, fireextinguishing systems and air pressure systems.
- The high quality of pressure switches is constantly proven through demanding tests, for example salt-spray corrosion tests or vibration tests.
- High long-term stability under extreme climates and temperature changes.
- For use with direct, alternating and rotary current application up to 15 kW.



Mining / chemistry

- As ATEX recognized production sites, we are able to manufacture a variety of possible customer-specified variations, for example with a reset function, with impact-resistant zinc or aluminium covers or with blue M20 cable glands.
- ATEX pressure controls, with a pressure range up to 250 bar, have been approved by TÜV Nord under the approval number TÜV 11 ATEX 079696. Control switches in the explosion protection type are used.



I M2 Ex ia I Mb Mining
(firedamp-susceptible mines)



II 2G Ex ia IIA, IIB, IIC T6 Gb Industry
(explosive gas atmospheres)



II 2D Ex ia IIIC T85°C Db Industry
(explosive dust atmospheres, except mines)

- Monitoring pressure of fluids and gases in pipelines, boilers, pressure tanks and devices, as well as level control over fluids and gases explosive areas.
- The high quality of pressure switches is constantly proven through demanding tests.
- With our switches, reliable devices are also available for use in vacuum applications for explosive areas.
- With ceramic measuring cells, shielded cable and an especially developed stainless steel casings, Condor offers high-precision fill-level probes with ATEX approval for the most diverse applications, for example wastewater.



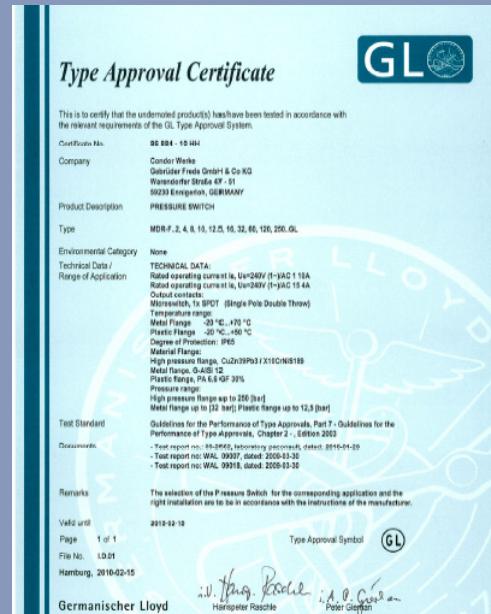
Railway technology / vehicles

- For applications in the field of railway technology, Condor offers special pressure switches in customer-specified variations.
- Monitoring pressure of fluids and gases in pipelines, boilers, pressure tanks and devices. In addition, in process controls, cooling and pressure technology as well as hydraulic applications.
- The high quality of pressure switches is constantly proven through demanding tests, for example salt-spray corrosion tests, vibration and shock or low temperature tests.
- High long-term stability under extreme climates and temperature changes.
- For use with direct, alternating and rotary current application up to 15 kW.
- The right choice of material for good fire protection.
- Connection available via electric, heavy-duty connector, for example via a rectangular industrial connector according to DIN EN 175301 (DIN 43650) or via a bayonet connector according to ISO 15170-1 (DIN 72585-1).



Condor

Certificates and approvals



Certified according to ISO 9001 : 2008

Condor is certified in ISO 9001 : 2008 and works together with various accredited laboratories.

As of August 5, 2014 Condor Pressure Control has reached the status of an AEO-C (Authorized Economic Operator) with the certificate no. DE AEOC 119710 for simplified customs processes.

You will find the certificate itself as a PDF-file in our Download Center - www.condor-cpc.com.



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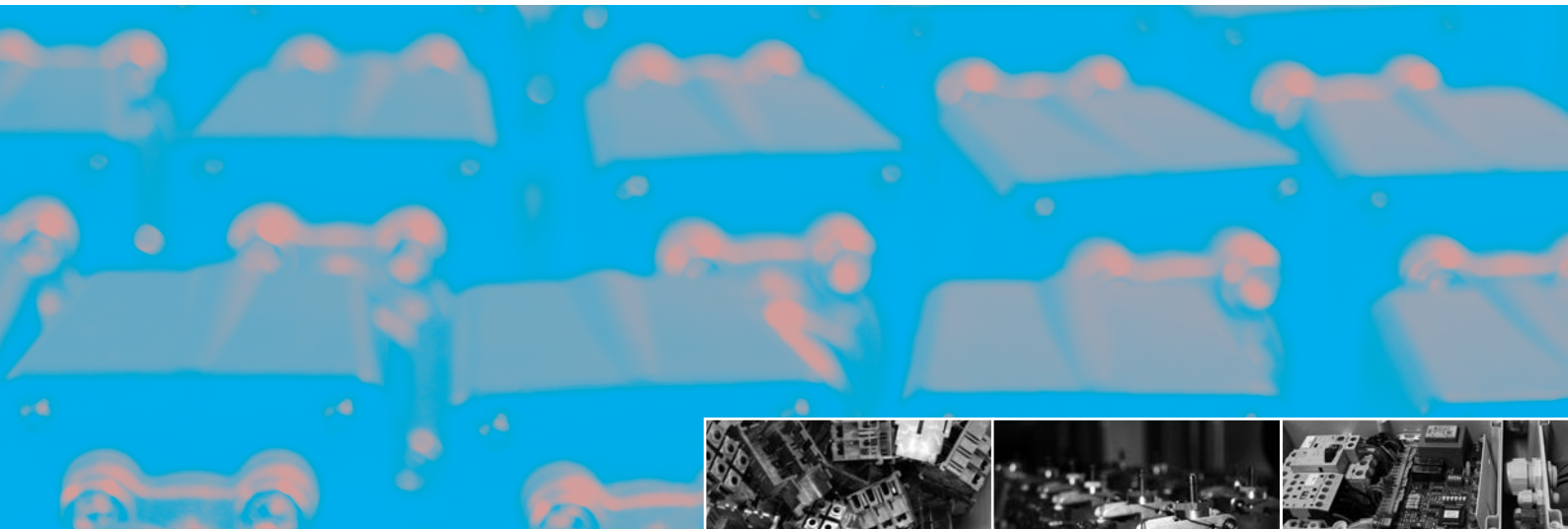
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Pressure switch setting references

Pressure switches

Pressure switches are typically used to maintain pressure in a tank (or similar closed system) between a pre-set upper and lower pressure value. In a "standard action" or Normally Closed (NC) pressure switch application, the upper pressure value at which a pressure switch breaks an electric circuit is called the cut-out pressure. The lower pressure value by which the pressure switch makes an electric circuit is called the cut-in pressure. Both cut-out and cut-in pressures within a given range can be adjusted on the pressure switch. In a "reverse action" or Normally Open (NO) pressure switch application, the upper setting point makes an electric circuit and the lower setting point breaks the electric circuit. The pressure switch related difference between cut-in and cut-out pressures is called "hysteresis". Every pressure switch allows the natural differential or hysteresis to be increased by a differential adjustment screw. An easy two-point control with a pressure switch is thus feasible.

Control pressure switches

Control pressure switches represent a special group within pressure switches. These devices are especially suitable for monitoring and controlling purposes. Depending on the model, SPDT's with or without gold flashed contacts, for example, for PLC applications or isolated NO and NC contacts are available. Depending on the pressure switch type, loads with a max. power consumption of 1.1 kW can be started directly.

Unloader valves- (EV) and delayed unloader valves (AEV)

Air compressor applications particularly reciprocating compressors, often use what is called an unloader valve. The function of the unloader valve is to remove the pressure from the piston of a compressor so that when it re-starts it can move freely and prevent the motor from stalling. The delayed unloader valve, on the other hand, additionally assists the motor when starting in that it remains open until a certain pressure (approx. 2 bars) is reached, thus giving the motor additional time to reach its full speed and torque.

The Installation instructions for our unloader valves, containing all the technical data and variations, are available for download on our homepage.

Pressure switch settings

Please make sure all power is disconnected before attempting to adjust pressure settings! When calibrating the pressure switch it will be necessary to apply pressure to the device. Use a calibrated pressure gage to adjust the switches set points.

When the main pressure spring is adjusted, the cut-in and cut-out value of all pressure switches change proportionally. In other words, the differential pressure remains the same. If the range between cut-in and cut-out value is to be increased, the differential pressure screw must be used.

When carrying out a differential pressure adjustment on the pressure switch types MDR 1, MDR 11, MDR 2 and MDR 21 the cut-out pressure value changes and the cut-in pressure value remains constant. (Notice: As a standard, the MDR 1 / MDR 11 are delivered without a differential adjustment screw but a differential adjustment screw is available as an accessory).

For all other pressure switch types the cut-in pressure value changes and the cut-out pressure value remains constant.

In the pressure diagram, each pair of cut-in and cut-values are represented by a point. If the point is within the shaded area of the diagram, then these pair of values can be set on the pressure switch. If the point is outside the shaded area, then these pair of values cannot be set on the pressure switch.

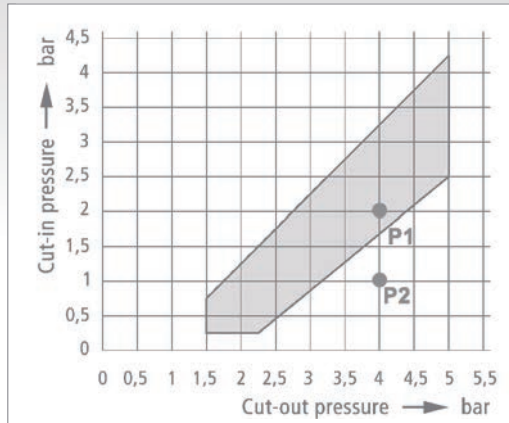
Under you tube you will find instructions for pressure adjustment – QR-Code.



Video - Pressure switch settings MDR-5/8



Example of a pressure setting using the MDR 5 pressure diagram



The coordinates of a cut-out pressure of 4 bar and a cut-in pressure of 2 bar intersect at a point P1 which lies within the shaded pressure range (pressure diagram of the respective pressure switch).

These two values can be adjusted on the pressure switch MDR 5/5.

The coordinates of a cut-out pressure of 4 bar and a cut-in pressure of 1 bar intersect at a point P2 which lies outside the shaded pressure range of the diagram. Accordingly, this pair of pressure values cannot be adjusted on the pressure switch MDR 5/5.

Flange versions

Many pressure switches are available with different flanges. The (first) dimension refers always to the main pressure port. All other ports are always 1/4" ports.

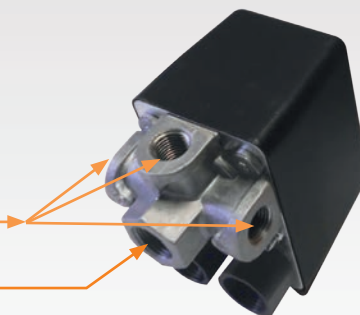
The name F4 1/2" means that there is a flange with 4 ports, in which the main pressure port is 1/2" female and the remaining 3 ports are 1/4" female. The example illustrates this fact:

Flange F4 1/2"

→ 4 ports

3 x G 1/4"

1 x G 1/2" - Main pressure port



Repeatability

The permissible tolerance of the switching values (repeatability) is < 3% less than the upper range value.

Service

Our service offers you the possibility of carrying out pressure settings depending on your requirements.

Of course, we can also mount any accessories you may need on demand, profiting at the same time from a complete warranty.

High performance pressure switches for AC currents

Overview



Type designation	MDR 1	MDR 1	MDR 11	MDR 11	MDR 2	MDR 21
Media *1	air	water	air	water	air / water	air / water
No. of poles	2 pole	2 pole	2 pole	2 pole	2 pole	2 pole
Contact function	2 N.C.	2 N.C.	2 N.C.	2 N.C.	2 N.C.	2 N.C.
Voltage	230 V	230 V	230 V	230 V	230 V	230 V
Motor switching capacity	4,0 kW	4,0 kW	4,0 kW	4,0 kW	2,2 kW	2,2 kW
Rated current	20 A	20 A	20 A	20 A	16 A	24 A
Flange types *2	G 1/4" F4 1/4" F4 3/8" F4 1/4" NPT Innerthread (Die-cast aluminium)	G 1/4" steel G 1/4" steel Ü	G 1/4" F4 1/4" F4 3/8" F4 1/4" NPT Innerthread (Die-cast aluminium)	G 1/4" steel G 1/4" steel Ü	G 1/4" F4 1/4" F4 3/8" F4 1/2" Innerthread (Die-cast aluminium)	G 1/4" F4 1/4" F4 3/8" F4 1/2" NPT
Pressure ranges (bar) Cut-out pressure from - to	1 2,5 - 11	1 2,5 - 6	1 2,5 - 11	1 2,5 - 6	2 1,5 - 12	2 1,5 - 12
Degree of Protection	IP 44	IP 44	IP 41/44	IP 41/44	IP 44	IP 41/44
Permissible media temperature: Air	-5...80 °C		-5...80 °C		-5...80 °C	-5...80 °C
Permissible media temperature: Water		70 °C		70 °C		
Max. cross-section (fine stranded)	2,5 mm²	2,5 mm²	2,5 mm²	2,5 mm²*	2,5 mm²	2,5 mm²
Standard Cable glands	with PG 11 Z/ZK	with PG 11 Z/ZK	with PG 13,5 Z/ZK	with PG 13,5 Z/ZK	with 2 x WN *4 (Accessory PG11 – 13,5)	with 2 x WN *4 (Accessory PG11 – 13,5)
Standard On / Off lever	with/without EA	with/without EA	with EA	with EA	with/without EA	with/without EA
Standard Differential setting	without differential setting (only as accessory)	without differential setting (only as accessory)	without differential setting (only as accessory)	without differential setting (only as accessory)	with differential setting	with differential setting
Standard Delayed (AEV) Unloader valve (EV)	with AEV (Accessory EV)	without	with AEV (Accessory EV)	without	without (Accessory EV, AEV)	without (Accessory EV, AEV)
Type designation	KEMA	KEMA	CSA / UL / KEMA	CSA / UL / KEMA	KEMA	CSA / UL / KEMA

* Table refers to catalogue product

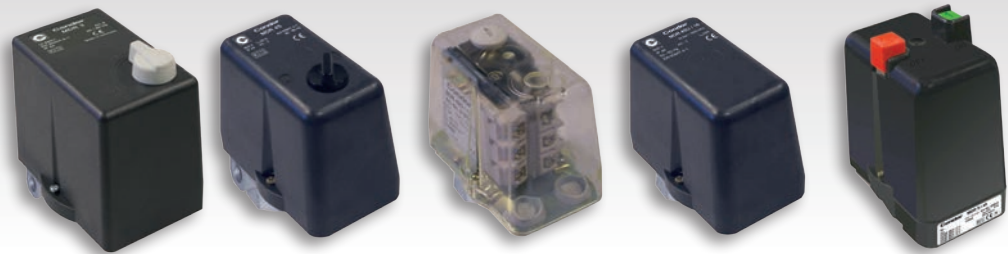
*1 Preferred / most used media, further media, see table on page 22 or on demand

*2 e.g. four-way flange F4 3/8" (main connection G3/8", additionally 3 x G 1/4" ports)

*3 Ü = switch need not be turned, use swivel nut for mounting

*4 WN = grommet

Overview



Type designation	MDR 3	MDR 4	MDR 4 SD	MDR 4 SU	MDR 5
Media ^{*1}	Air and water	Air and water	Air and water	Air and water	Air and water
No. of poles	3 pole	3 pole	3 pole	3 pole	3 pole
Contact function	3 NC	3 NC	3 NC	3 NO	3 NC
Voltage ^{*3}	400 V	400 V	400 V	400 V	400 V
Motor switching capacity	7,5 kW (11 kW ^{*6})	5,5 kW	5,5 kW	4 kW	5,5 kW
Rated current	24 A	20 A	20 A	16 A	16 A
Flange types ^{*2}	G 1/2" G 1/4" F4 1/2" F4 3/8" F4 1/4" F4 1/4" NPT Innerthread - Die-cast aluminium	G 1/2" G 1/4" G 1/2" + G 1/4" F4 1/2" F4 3/8" F4 1/4" Innerthread - Die-cast aluminium	G 1/2" G 1/4" Innerthread - Die-cast aluminium	G 1/2" Innerthread - Die-cast aluminium	G 1/2" G 1/2" + G 1/4" Innerthread - Die-cast aluminium - Stainless steel - brass
Pressure ranges (bar) Cut-out pressure from - to	5 1,3 - 35	3 1,5 - 16	2 1,5 - 11	3 1,5 - 16	5 1,5 - 45
Degree of protection	IP 54	IP 44	IP 44	IP 44	IP 54 / IP 65 ^{*5}
Permissible media temperature: Air	-5...80 °C	-5...80 °C	-5...80 °C	-5...80 °C	-5...80 °C
Permissible media temperature: Water	80 °C	80 °C	80 °C	80 °C	80 °C
max. cross-section (fine stranded)	4,0 mm ²	2,5 mm ²	2,5 mm ²	2,5 mm ²	2,5 mm ²
Standard Cable glands	with 2 x WN ^{*4} (Accessory PG11 - 16)	with 2 x WN ^{*4} (Accessory PG11 - 13,5)	with 2 x WN ^{*4} (Accessory PG11 - 13,5)	with 2 x WN ^{*4} (Accessory PG11 - 13,5)	without (Accessory M 20)
Standard On / Off lever	with/without EA	with/without EA	without EA	without EA	with/without EA
Standard Differential setting	with differential setting with	with differential setting	with differential setting	with differential setting	with differential setting
Type designation	CSA / UL / KEMA	KEMA			KEMA
Standard delayed (AEV) – unloader valve (EV)	without (Accessory EV, AEV)	without (Accessory EV, AEV)	without (Accessory EV, AEV)	without (Accessory EV, AEV)	without (Accessory EV, AEV)

* Table refers to catalogue product

^{*1} Preferred / most used media, further media, see table on page 22 or on demand

^{*2} e.g. four-way flange F4 3/8" (main connection G3/8", additionally 3 x G 1/4" ports)

^{*3} Higher voltages on demand

^{*4} WN = grommets

^{*5} Special execution without on / off switch

^{*6} 11 kW on request

Overview



Type designation	MDR F..H Die-cast aluminum	MDR-F..Y Plastic	MDR-F..HE Stainless steel	MDR-F..HH High pressure	MDR-F.. Reset function
Contact function	1 SPDT*1	1 SPDT*1	1 SPDT*1	1 SPDT*1	1 SPDT*1
Voltage	230 V	230 V	230 V	230 V	230 V
Motor switching capacity	0,55 kW	0,55 kW	0,55 kW	0,55 kW	0,55 kW
Current AC 15	4 A	4 A	4 A	4 A	4 A
Flange types Standard (bold)	G 3/8" G 1/2" G 1/4" 1/4" NPT Inner thread (Die-cast aluminum)	G 3/8" Inner thread (plastic)	G 1/4" Inner thread (Stainless steel)	G 3/8" Inner thread (Stainless steel + throttle)	Flanges on demand
Pressure ranges (bar) Cut-out pressure from - to	6 0,11 - 32	5 0,11 - 16	2 1 - 30	3 8 - 250	Pressure ranges on demand
Degree of Protection	IP 54 / IP 65	IP 54 / IP 65	IP 54 / IP 65	IP 54 / IP 65	IP 54 / IP 65
Cable glands	WN / M 20	WN / M 20	WN / M 20	WN / M 20	WN / M 20
Permissible media temperature *2	- 25 .. + 70 °C	- 20 .. + 50 °C	200 °C	70 °C	according to selection
Type designation	VdS to 16 bar UL/GL Atex	VdS to 10 bar GL to 12,5 bar Atex	- - Atex	UL / GL Atex	- GL on request Atex on request

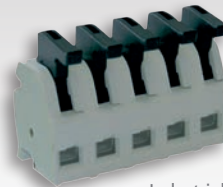
*1 = SPDT with gold-flashed contacts / 2 SPDT / NC + NO for special applications - on request

*2 = Other diaphragms and further temperature ranges on request

Connection system



Industrial screw version
(standard)



Industrial clamp version
(upon request)



Connector according to
ISO 15170-1 (DIN 72585-1)
-on request



Connector according to
DIN EN 175301 (DIN 43650)
-on request



Connector according to
M 12 x 1 DIN EN 61076
-on request

Overview



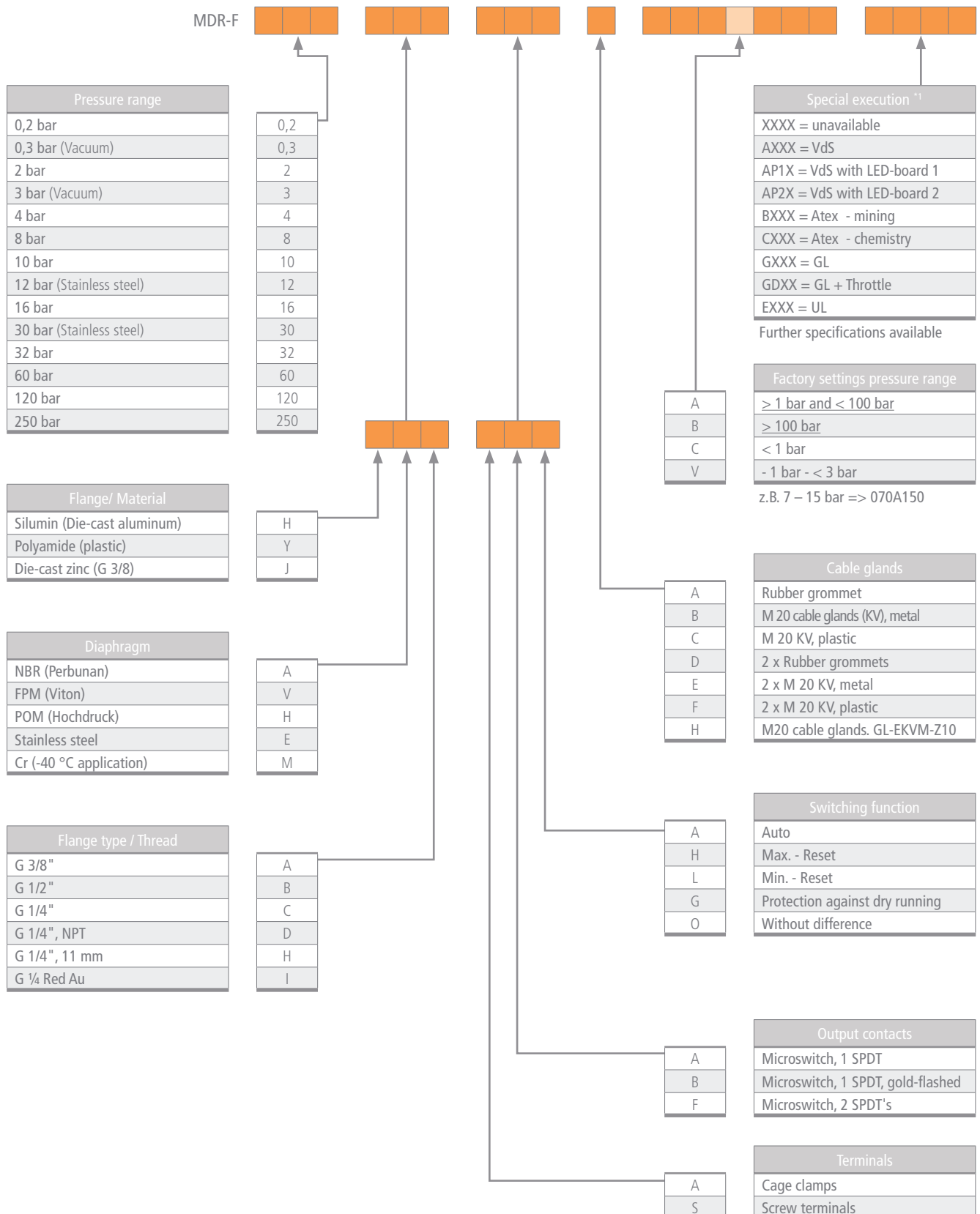
Type designation	MDR – F Vacuum	MDR - P	MDR - K	MDR 43	MDR 53
Contact function	1 SPDT ^{*1} / 2 SPDT's	1 SPDT ^{*1}	2 SPDT's	1 N:C: 1 N.O.	1 SPDT
Voltage	230 V	230 V	230 V	230 V	230 V
Motor switching capacity	0,55 kW	0,55 kW	0,55 kW	1,1 kW	0,55 kW
Current AC 15	4 A	4 A	4 A	8 A	4 A
Flange types Standard (bold)	G 1/4" Inner thread	G 1/4" Outer thread	G 1/4" Outer thread	G 1/2" G 1/4" Inner thread (Die-cast aluminium)	G 1/2" Inner thread (Die-cast aluminium)
Pressure ranges Cut-out pressure from ... to	2 - 0,7 - 3 bar	optional 0,3 - 16 bar	3 0,5 - 11 bar	4 0,5 - 16 bar	4 0,3 - 16 bar
Degree of Protection	IP 54 / IP 65	IP 65	IP 67	IP 44	IP 54
Cable glands	WN / M 20	Coupling	Coupling	optional	optional
Permissible media temperature ^{*2}	- 25 .. + 70 °C	- 25 .. + 70 °C	- 40 .. + 70 °C	- 30 .. + 80 °C	- 30 .. + 80 °C
Type designation	- Atex				- KEMA

^{*1} = SPDT with gold-flashed contacts for special applications on request

^{*2} = further temperature ranges on request

Type code for control pressure switch MDR-F

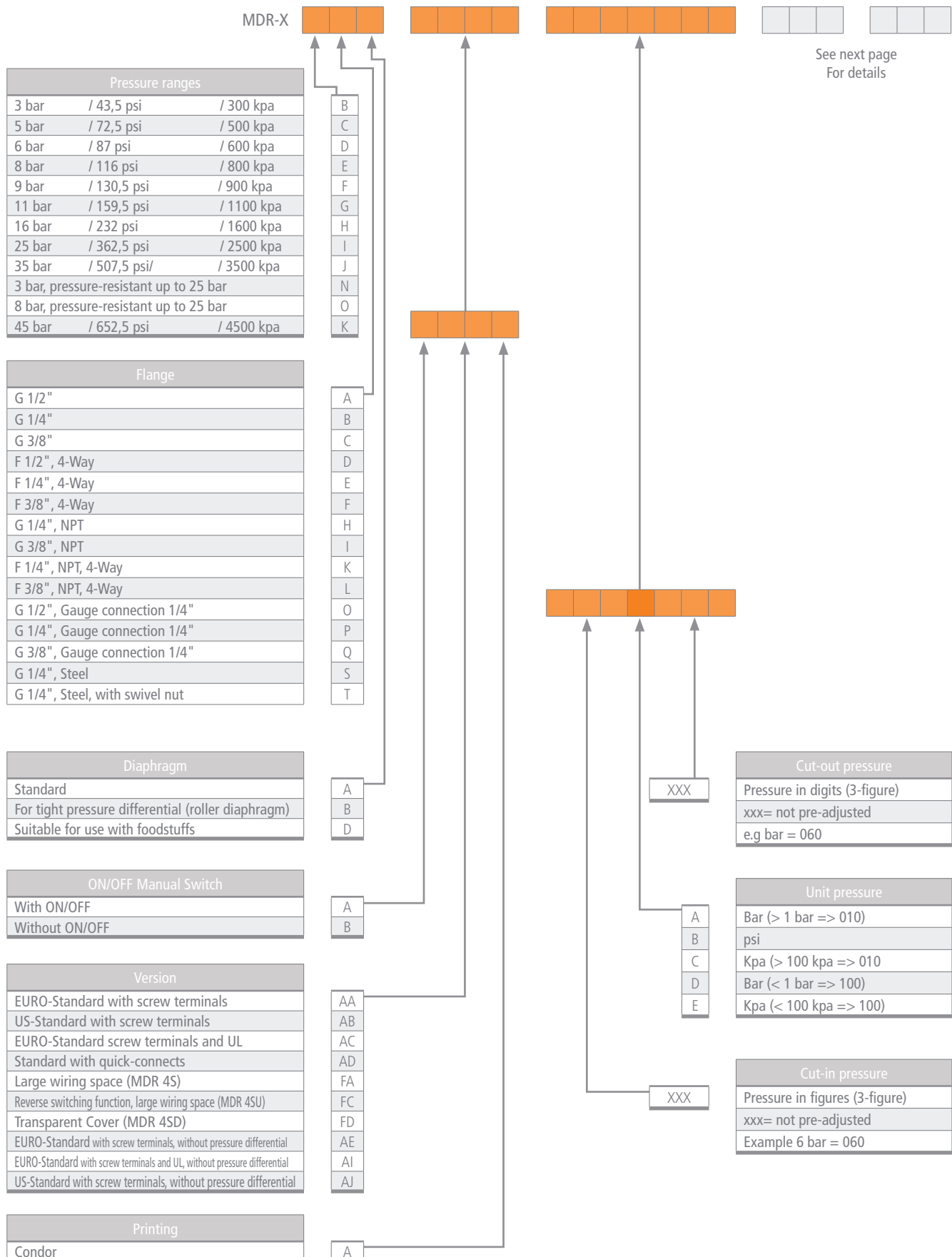
For decoding pressure switch types:
Standard settings, Accessories and Special Execution





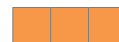
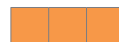
Type code

For high performance pressure switches MDR 1 up to MDR 5 and control pressure switches MDR 43 and MDR 53 For decoding of pressure switch types: Standard settings



For high performance pressure switches MDR 1 up to MDR 5 and control pressure switches MDR 43 und MDR 53 For decoding of pressure switch types: Accessories

MDR-X



Valves
Without unloader valves
Unloader valves EV, screw fitting 6 mm
Unloader valves EV i, screw fitting 1/4"
Unloader valves EV S, quick-connect 6 mm
Unloader valves EV W, 90°, screw fitting 6 mm
Unloader valves EV Wi, 90°, screw fitting 1/4"
Unloader valves EV WS, 90°, quick-connect. 6 mm
Unloader valves EV M5, screw fitting 6 mm, port fitting M5
Unloader valves EVi M5, screw fitting 1/4", port fitting M5
Unloader valves EV WSi, 90°, quick-connect 1/4"
Unloader valves EV Ei, screw fitting 1/4"
Unloader valves EV H, screw fitting 6 mm
Unloader valves EV L, screw fitting 6 mm, port fitting 6 mm
Unloader valves EV Li, screw fitting 1/4", port fitting 6 mm
Unloader valves AEV, screw fitting 6 mm
Unloader valves AEV i, screw fitting 1/4"
Unloader valves AEV S, quick connect 6 mm
Unloader valves AEV W, 90°, screw fitting 6 mm
Unloader valves AEV Wi, 90°, screw fitting 1/4"
Unloader valves AEV WS90°, quick-connect 6 mm
Unloader valves AEV WSi, 90°, quick-connect 1/4"
Unloader valves EV E, screw fitting 6 mm for MDR 5, 6
Unloader valves EV 5, screw fitting 6 mm, port fitting 6 mm
Unloader valves EV Si, quick-connect 6 mm

Cable glands
Without cable glands
Cable grommets / blanking plug
PG 11 conduit
PG 11 complete
PG 11 Z with strain relief
PG 11 ZK with strain relief and cable support
PG 13.5 conduit
PG 13.5 complete
PG 13.5 Z with strain relief
PG 13.5 ZK with strain relief and cable support
PG 16 conduit
PG 16 complete
PG 16 Z with strain relief
PG 16 ZK with strain relief and cable support
PG 16/13,5 ZK with strain relief and cable support
PG 16/13,5 Z with strain relief
PG 16/11 complete

X
A
B
C
D
E
F
G
H
I
J
K
M
N
O
P
Q
R
S
T
U
V
W
Y

X	X
A	A
B	B
C	C
D	D
E	E
F	F
G	G
H	H
I	I
J	J
K	K
L	L
M	M
N	N
O	O
P	P

X
A
B
G
J
I
K
L
S

Special Accessories
Without special accessories
ST Mini Barb EV/AEV connector for plastic tubing
Terminal cover, VBG 4 MDR 2
Additional cable glands PG 9V MDR 3
Hourmeter kit 400 V / 50 Hz
Hourmeter kit 230 V / 50 Hz
Hourmeter kit / battery supplied
auxiliary switch
scale

X
A
B
C
D
E
F
G
H
I
J

Releases
Without release
Undervoltage release 230 V / 50 Hz
Undervoltage release 400 V / 50 Hz
Undervoltage release 480 V / 60 Hz
Undervoltage release 240 V / 60 Hz
Shunt release 24 V / 50 Hz
Shunt release 110 V / 50 Hz
Shunt release 230 V / 50 Hz
Undervoltage release 24 V / 50 Hz
Shunt release 400 V / 50 Hz
Undervoltage release 400 V / 50 Hz + phase monitoring board

X
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
Y

Releases (Note: use off small/capital initial letters)
Without overload relay
Without contact block
Overload relay 0.63 – 1.0 A
Overload relay 1.0 – 1.6 A
Overload relay 1.6 – 2.5 A
Overload relay 2.5 – 4.0 A
Overload relay 4.0 – 6.3 A
Overload relay 6.3 – 10.0 A
Overload relay 10.0 – 16.0 A
Overload relay 16.0 – 20.0 A
Overload relay 20.0 – 24.0 A
Overload relay 20.0 – 30.0 A, 2 pole
Overload relay 10,0 – 16,0 A, for higher switching capacity
Overload relay 16,0 – 20,0 A, for higher switching capacity
Overload relay 20,0 – 24,0 A, for higher switching capacity
Overload relay 0,86 - 1,5 A
Overload relay 1,5 - 2,45 A
Overload relay 2,4 - 4,2 A
Overload relay 4,0 - 7,0 A
Overload relay 6,1 - 10,3 A
Overload relay 9,0 - 14,0 A
Overload relay 11,0 - 18,0 A
Overload relay 18,0 - 25,0 A, 2 pole

Overview of media resistance

Type of pressure switch	MDR 3 RM MDR 5 MDR F MDR-P MDR-K	MDR F MDR P	MDR F (high pressure)	MDR F	MDR 43 MDR 53	MDR 1 MDR 11	MDR 2 MDR 21 MDR 3 MDR 4
Catalogue page	37 ff, 50 ff, 57 ff, 70 ff, 73 ff	57 ff, 70 ff	59 ff	58 ff	76 ff, 78 ff	25 ff, 29 ff	31 ff, 34 ff, 37 ff, 45 ff
Medium* Diaphragm material	NBR Perbunan	FPM Viton	Polyacetal POM	Stainless steel	CR + PA6.6 603 C	TPE Hytrel	NBR/SBR NL348-1
(ammonia solution)	2	1	1	1		2	
Aceton CH_3COCH_3 CH_3COCH_3		X		1			
Acetylene $\text{HC} = \text{CH}$ $\text{HC} = \text{CH}$	1	1	1	1	1	1	
air	1	1	1	1	1	1	1
Ammonia, 25 %		1		1			
Ammonia, watery 100 %		X		1			
Benzene		1		1		2	
Butane C_4H_{10} C_4H_{10}	1	1	1	1	1	1	
Butyl acetate $\text{CH}_3\text{COOC}_4\text{H}_9$		X		1		2	
Butyl alcohol $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH}$				1			
Carbon dioxide CO_2	1	1	1	1	1	1	
Carbonic acid H_2CO_3	1	1	1	1			
Chlorine Cl_2		2					
Cooling liquid		1		1			2
Diesel	1	1	1	1			2
Dimethylbenzene $\text{C}_6\text{H}_4(\text{CH}_3)_2$		1		1			
Ethyl acetate $\text{CH}_3\text{OOC-CH}_2\text{CH}_3$ $\text{CH}_3\text{OOC-CH}_2\text{CH}_3$				1		2	
Ethylene glycol $\text{CH}_2\text{OH-CH}_2\text{OH}$ $\text{CH}_2\text{OH-CH}_2\text{OH}$	1	1	1	1		1	
Fuel oil	1	1	1	1			
Glycerol $\text{CH}_2\text{OH-CHOH-CH}_2\text{OH}$ $\text{CH}_2\text{OH-CHOH-CH}_2\text{OH}$	1	1	1	1	1		
Hydrogen H_2	1	1	1	1	1	1	
Methyl chloride CH_3Cl		1		1			
Mineral oil	1	1		1	2	1	2
Natural gas	1	1	1	1	1		
Nitrogen N_2	1	1	1	1			
Oxygen O_2		1		1			
Ozone		1		1			
Perchlorethylene $\text{CCl}_2=\text{CCl}_2$ $\text{CCl}_2=\text{CCl}_2$		1		1			
Petroleum	1	1	1	1	1		
Phenolic acid $\text{C}_6\text{H}_5(\text{OH})$				1			
Propane C_3H_8	1	1	1	1	1		
Shielding gases				1			
Silicone oil	1	1			1		
Sulfur dioxide SO_2				1	1		
Synthetic oils	1	1		1			2

Pressure switches, general

Type of pressure switch	MDR 3 RM MDR 5 MDR F MDR-P MDR-K	MDR F MDR P	MDR F (high pressure)	MDR F	MDR 43 MDR 53	MDR 1 MDR 11	MDR 2 MDR 21 MDR 3 MDR 4
Toluene (Phenylmethane) $C_6H_5CH_3$		1		1			
Trichlorethene $CHCl=CCl_2$		1		1			
Urine	1	1					
Vegetable oil	1	1		1			
Vinegar 25 %				1			
Water - Sea water	1	1	1	1	1	1	
Water - water vapor	1	1		1			
Water Distilled, aired	1	1	1	1	1	1	
Water H_2O	1	1	1	1	1	1	1

1 = resistant, 2 = limited resistance, x = not resistant, empty field = not tested

*) Made of corrosion-chemical point of view please note when installing the pressure switch (G-AlSi 12) on pipes, fittings or fittings material selection. The installation must be in accordance with the relevant standards - Flange.

The data of a.m. table does not only result from laboratory tests but also from long-lasting experiences. These are reference points. As the chemical effect of a given media may be affected by additives, temperature differences and mixtures amongst themselves, we recommend to carry out a media resistance test before using the product.





High performance pressure switches



High performance pressure switches for AC currents

Industries



MDR 1	AC current; switching capacity 4.0 kW Max. cut-out pressure 11 bar	P. 25	Compressors, pumps
MDR 11	AC current; switching capacity 4.0 kW Max. cut-out pressure 11 bar / 160 psi UL / CSA-approval optional	P. 28	Compressors, pumps
MDR 2	current; switching capacity 2.2 kW Max. cut-out pressure 12 bar	P. 31	Compressors, pumps
MDR 21	AC current; switching capacity 4.0 kW Max. cut-out pressure 12 bar / 175 psi UL / CSA-approval optional	P. 34	Compressors, pumps



High performance pressure switches for 3-phase currents

Industries



MDR 3	3-phase; switching capacity 7.5 (11) kW available with overload relays Max. cut-out pressure 35 bar UL / CSA-approval optional	P. 37	Compressors, pumps
MDR 4	3-phase; switching capacity 4.0 / 5.5 kW Max. cut-out pressure 25 bar	P. 44	Compressors, pumps
MDR 5	3-phase; switching capacity 5.5 kW available with overload relays Max. cut-out pressure 45 bar	P. 50	Compressors, pumps

NEW!

NEW!

Pressure switch MDR 1

Pressure switch MDR 1 / 6, Pump version



- Single phase
- Switching capacity 4.0 kW
- Max. cut-out pressure 6 bar
- Incl. s PG 11 Z/ZK
- 2-pole (N.C.)
- Steel flange
- Acc. to EN 60947
- Optional differential adjustment
- Flange = steel (Ü = with screw connection)



Steel flange ST-Ü

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 1/6	MDR-1 DSD BAEA 017A030 XDE XXX	-	2,5 - 6	G 1/4" ST	220	212119
MDR 1/6	MDR-1 DTD BAEA 017A030 XDE XXX	-	2,5 - 6	G 1/4" ST-Ü	220	212126

Pressure switch MDR 1 / 11, Compressor version



- Single phase
- Switching capacity 4.0 kW
- Max. cut-out pressure 11 bar
- Incl. cable glands PG 11 Z/ZK
- and unloader valve AEV 1 S
- 2-pole (N.C.)
- Acc. to EN 60947
- Optional differential adjustment

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR1/11-EA	MDR-1 GBA AAEA 060A080 QDE XXX	EA	2,5 - 11	G 1/4" Alu	220	212133
MDR1/11-EA	MDR-1 GEA AAEA 060A080 QDE XXX	EA	2,5 - 11	F4 1/4" Alu	220	212140
MDR1/11-EA	MDR-1 GFA AAEA 060A080 QDE XXX	EA	2,5 - 11	F4 3/8" Alu	220	212157
MDR1/11	MDR-1 GBA BAEA 060A080 QDE XXX	-	2,5 - 11	G 1/4" Alu	220	216049
MDR1/11	MDR-1 GEA BAEA 060A080 QDE XXX	-	2,5 - 11	F4 1/4" Alu	220	216025
MDR1/11	MDR-1 GFA BAEA 060A080 QDE XXX	-	2,5 - 11	F4 3/8" Alu	220	216063

Technical Data MDR 1

Rated insulation voltage U _i	500 V
Motor switching capacity (AC 3) U _e =240 V (1~)	4,0 kW
Electrical life (AC 3) Cycles	> 1 x 10 ⁵
Mechanical life Cycles	> 5 x 10 ⁵
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	600
Rated operational current I _e at 240 V AC	20 A
Bursting strength P _z	> 35 bar
Permissible medium temperature Air	- 5...+ 80 °C

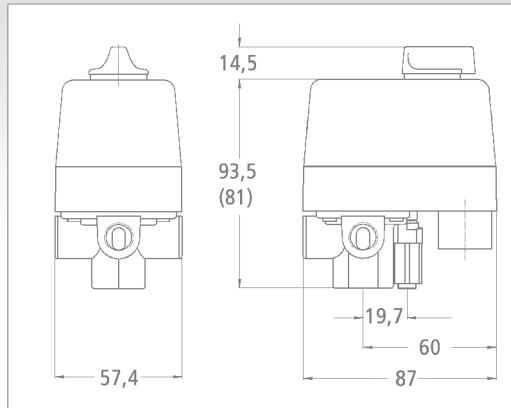
Technical Data MDR 1 acc. to 60947 UL/CSA

Permissible medium temperature Water	+ 70 °C
Degree of Protection acc. to EN 60529	IP 44
Conductor cross-section 1 .. fine stranded cable 1 x / 2 x	2,5 / 2,5 mm ²
Conductor cross-section 1 rigid cable 1 x / 2 x	2,5 / 2,5 mm ²

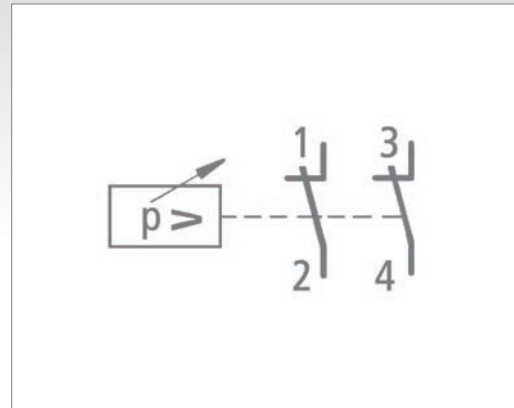
Diaphragm media resistance MDR 1

A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.

Dimensions / Circuit Diagrams MDR 1



Pressure switch MDR-1



Accessories MDR 1

Order reference	Description	Weight (in g)	Part No
Unloader valves			
EV 15*	with quick-connect 6 mm for plastic unloader valves	25	226765
Delayed unloader valves			
AEV 15*	with quick-connect 6 mm for plastic unloader valves	25	217541
Cable glands			
WN	Grommet	6	200888
PG 11 G	Conduits for mounting of cable glands (inner thread)	6	255024
PG 11 Z		12	255031
PG 11 ZK	With strain relief and cable support	12	255048
Cover			
H1 (Cover MDR 1)	Cover without On/Off lever (Neutral version, without marking)	40	230700
H1-EA (Cover MDR 1 + EA)	Cover with On/Off lever for manual On/Off (Neutral version, without marking)	40	227366
Cover MDR 1 + EA + lever	Conversion kit H1 to cover H1-EA	40	230717
Differential adjustment			
MDR-1 Differential kit	Kit for setting cut-in and differential pressures (10 pcs.)	20	230618

*only for pneumatic tubes with outside tolerances according to e. g. Festo PAN 6x1 mm

Unloader valves / Delayed unloader valves

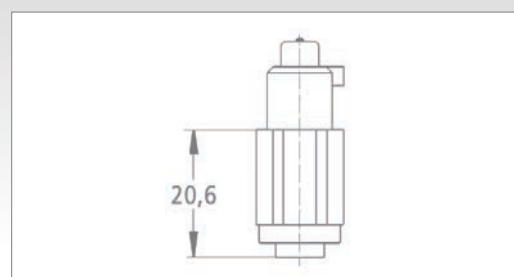
Dimensions unloader valves



EV 15



AEV 15

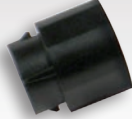


EV 15 / AEV 15

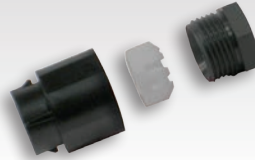
Cable glands MDR 1



WN



PG 11 G

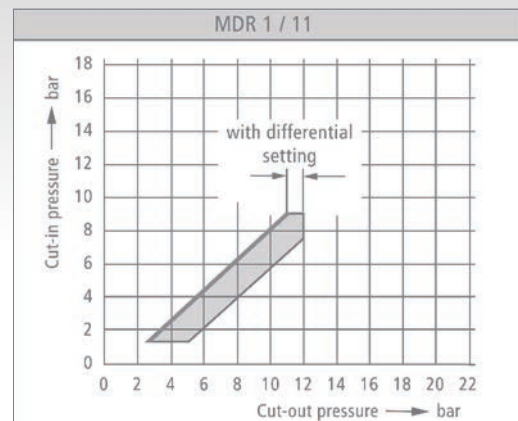
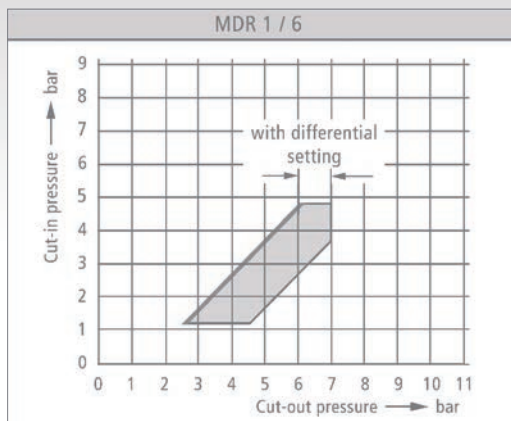


PG 11 Z



PG 11 ZK

Pressure Diagrams MDR 1



Explanation

Devices without differential pressure adjustment

After selecting the cut-in pressure, the cut-out pressure can be read from the pressure diagram. If only the cut-out pressure is known, the cut-in pressure to be set can also be determined from the diagram.

Example: MDR 1/6 without differential pressure adjustment

For a preselected cut-in pressure of 4 bar, the cut-out pressure is 5 bar. If, for example, the cut-out pressure is to be 4 bar, a cut-in pressure of approx. 2.7 bar has to be set.

Devices with differential pressure adjustment

An intersecting point is determined in the diagram by selecting a pair of cut-in and cut-out pressure values. If this point lies within the shaded area, this pair of values can be set on the pressure switch. If this point lies outside the shaded area, these values cannot be set.

Example: MDR 1/11 with differential pressure adjustment

With a preselected cut-in pressure of 4 bar, the cut-out pressure can be determined and set between 5.4 and 8 bar using the differential pressure adjustment.

Pressure switch MDR 11

Pressure switch MDR 11 / 6, Pump version



- Single phase
- Switching capacity 4.0 kW / 4 HP
- Max. cut-out pressure 6 bar / 87 psi
- Incl. cable glands PG13.5 Z/ZK
- 2-pole (N.C.)
- Steel flange
- Acc. to EN 60947
- UL / CSA-approval optional
- Optional differential adjustment
- Flange = steel (Ü = with screw connection)



Steel flange ST-Ü

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 11/6-EA	MDR-11 DSD AAIA 017A030 XHI XXX	EA	2,5 - 6	G 1/4" ST	300	235712
MDR 11/6-EA	MDR-11 DTD AAIA 017A030 XHI XXX	EA	2,5 - 6	G 1/4" ST-Ü	320	235729

Cable glands for retrofitting, see accessories!

Pressure switch MDR 11 / 11, Compressor version



- Single phase
- Switching capacity 4.0 kW / 4 HP
- Max. cut-out pressure 11 bar / 160 psi
- Incl. cable glands PG13,5 Z/ZK
- With delayed unloader valve AEV 11 S
- 2-pole (N.C.)
- Acc. to EN 60947
- UL / CSA-approval optional
- Optional differential adjustment
- Flange = Die-cast aluminium

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 11/11-EA	MDR-11 GBA AAIA 060A080 QHI XXX	EA	2,5 - 11	G 1/4" Alu	300	235736
MDR 11/11-EA	MDR-11 GEA AAIA 060A080 QHI XXX	EA	2,5 - 11	F4 1/4" Alu	320	235743

Unloader valves and cable glands for retrofitting, see accessories!

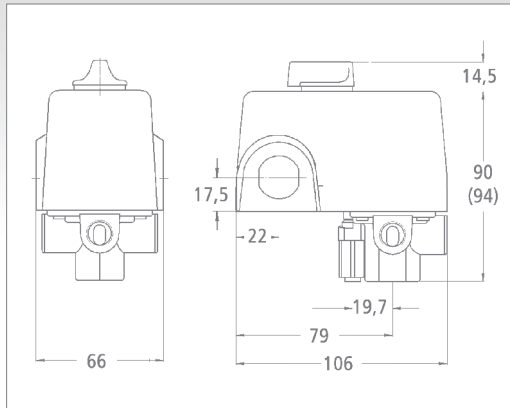
*) = with Flange F4 3/8" or F4 1/4" NPT on request

Technical Data MDR 11 acc. to 60947 UL/CSA	
Rated insulation voltage U _i	500 V
Motor switching capacity (AC 3) U _e =240 V (1~)	4,0 kW
Motor switching capacity (UL 508, CSA 22.2) U _e =240 V (1~) / U _e =120 V (1~)	3,0 HP/2,0 HP
Electrical life (UL 508, CSA 22.2) U _e =240 V dc; 2,7A	0,5 HP
Electrical life (AC 3) Cycles	> 1 x 10 ⁵
Mechanical life Cycles	> 5 x 10 ⁵
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	600
Rated operational current I _e (EN 60947) at 240 V AC	20 A
Rated operational current I _e (UL/CSA) at 240 V AC	26 A
Bursting strength P _z	> 35 bar

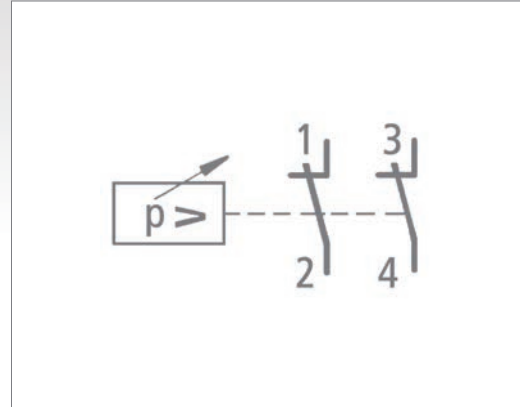
Technical Data MDR 11 acc. to 60947 UL/CSA	
Permissible medium temperature Air	- 5...+ 80 °C
Permissible medium temperature Water	+ 70 °C
Degree of Protection acc. to EN 60529	IP 44
Conductor cross-section 1 .. fine stranded cable 1 x / 2 x	2,5 / 2,5 mm ²
Conductor cross-section 1 rigid cable 1 x / 2 x	2,5 / 2,5 mm ²

Diaphragm media resistance MDR 11	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

Dimensions / Circuit Diagrams MDR 11



Pressure switch MDR 11



Accessories MDR 11

Order reference	Description	Weight (in g)	Part No.
Unloader valves			
EV 1 S*	with quick-connect 6 mm for plastic unloader valves	25	226765
EV 1 WSi	90° unloader valve with quick-connect for 1/4" plastic tubes, quick-connect can be rotated 360°	25	247593
Delayed unloader valves			
AEV 1 S*	with quick-connect 6 mm for plastic unloader valves	25	217541
Cable glands			
WN	Grommets	6	201243
PG 13,5 Z-21	With strain relief	12	201021
PG 13,5 ZK-21	With strain relief and cable support	12	201038
Differential pressure adjustment			
MDR 1 Differential kit	Kit for setting cut-in and differential pressures (10 pcs.)	20	230618

*only for pneumatic tubes with outside tolerances according to e. g. Festo PAN 6x1mm

Unloader valves / Delayed unloader valves



EV 1S



EV 1WSi



AEV 1S

Cable glands MDR 11



WN

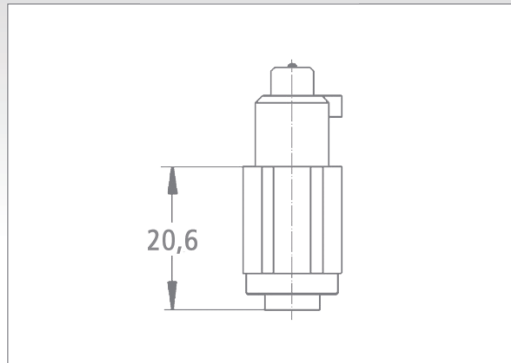


PG 13,5 Z-21

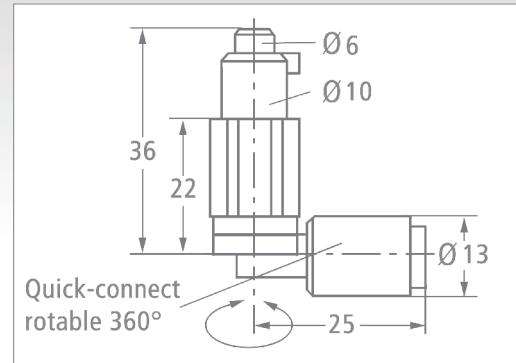


PG 13,5 ZK-21

Dimensions, Accessories MDR 11

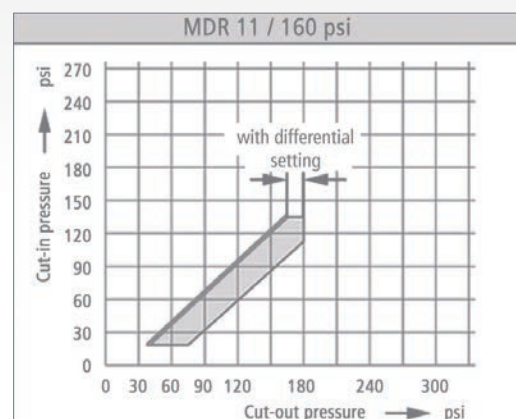
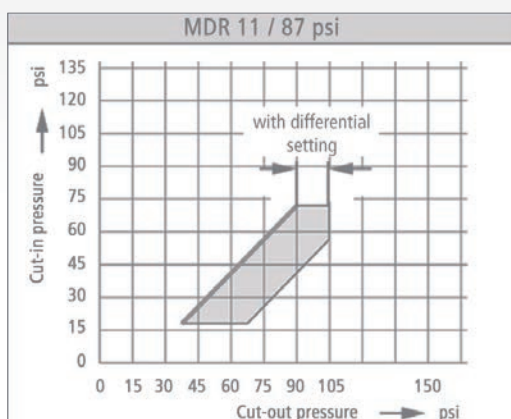
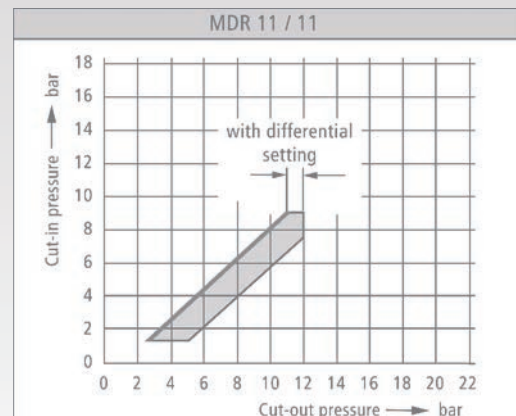
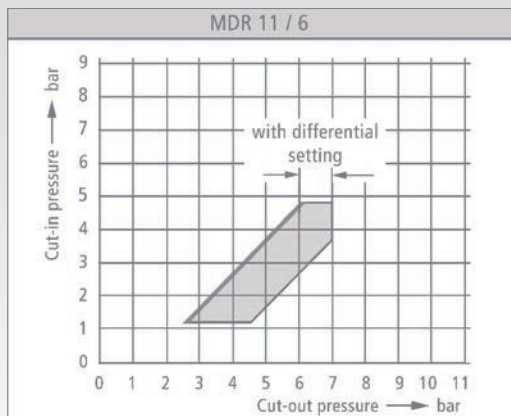


EV 1S / AEV 1S



EV 1WSi

Pressure Diagrams MDR 11



Explanation

Devices without differential pressure adjustment

After selecting the cut-in pressure, the cut-out pressure can be read from the pressure diagram. If only the cut-out pressure is known, the cut-in pressure to be set can also be determined from the diagram.

Example: MDR 1/6 without differential pressure adjustment

For a preselected cut-in pressure of 4 bar, the cut-out pressure is 5 bar. If, for example, the cut-out pressure is to be 4 bar, a cut-in pressure of approx. 2.7 bar has to be set.

Devices with differential pressure adjustment

An intersecting point is determined in the diagram by selecting a pair of cut-in and cut-out pressure values. If this point lies within the shaded area, this pair of values can be set on the pressure switch. If this point lies outside the shaded area, these values cannot be set.

Example: MDR 1/11 with differential pressure adjustment

With a preselected cut-in pressure of 4 bar, the cut-out pressure can be determined and set between 5.4 and 8 bar using the differential pressure adjustment.

Pressure switch MDR 2



- Single phase
- Switching capacity 2.2 kW
- Max. cut-out pressure 12 bar
- 2-pole (N.C.)
- Acc. to EN 60947
- Flange = Die-cast aluminium

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 2/6-EA	MDR-2 DBA AAAA 015A030 XAA XXX	EA	1,5 - 7	G 1/4" Alu	300	212164
MDR 2/11-EA	MDR-2 GBA AAAA 070A090 XAA XXX	EA	4 - 12	G 1/4" Alu	300	212171
MDR 2/11-EA	MDR-2 GEA AAAA 070A090 XAA XXX	EA	4 - 12	F4 1/4" Alu	320	212188
MDR 2/11-EA	MDR-2 GFA AAAA 070A090 XAA XXX	EA	4 - 12	F4 3/8" Alu	320	212195
MDR 2/11-EA	MDR-2 GDA AAAA 070A090 XAA XXX	EA	4 - 12	F4 1/2" Alu	320	212201
MDR 2/6	MDR-2 DBA BAAA 015A030 XAA XXX	-	1,5 - 7	G 1/4" Alu	300	217381
MDR 2/11	MDR-2 GBA BAAA 070A090 XAA XXX	-	4 - 12	G 1/4" Alu	300	217404
MDR 2/11	MDR-2 GEA BAAA 070A090 XAA XXX	-	4 - 12	F4 1/4" Alu	320	219408
MDR 2/11	MDR-2 GFA BAAA 070A090 XAA XXX	-	4 - 12	F4 3/8" Alu	320	226888
MDR 2/11	MDR-2 GDA BAAA 070A090 XAA XXX	-	4 - 12	F4 1/2" Alu	320	226895

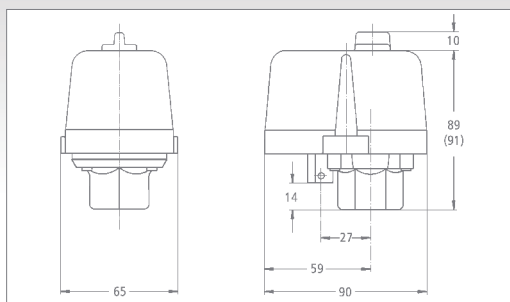
Unloader valves and cable glands for retrofitting, see accessories!

Technical Data MDR 2 acc. to 60947	
Rated insulation voltage U _i	500 V
Motor switching capacity (AC 3) U _e =240 V (1~)	2,2 kW
Electrical life (AC 3) Cycles	> 1 x 10 ⁵
Mechanical life Cycles	> 5 x 10 ⁵
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	600
Rated operational current I _e at 240 V AC 3	16 A
Bursting strength P _z	> 35 bar
Permissible medium temperature Air	- 5...+ 80 °C

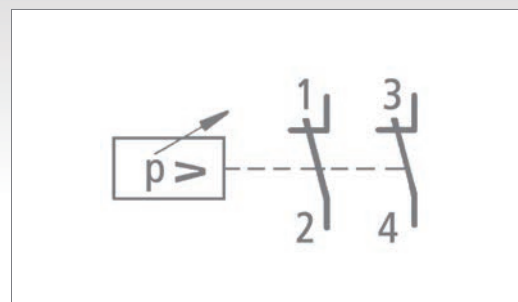
Technical Data MDR 2 acc. to 60947	
Permissible medium temperature Water	+ 80 °C
Degree of Protection acc. to EN 60529	IP 44
Conductor cross-section 1 .. fine stranded cable 1 x / 2 x	2,5 / 2,5 mm ²
Conductor cross-section 1 rigid cable 1 x / 2 x	2,5 / 2,5 mm ²

Diaphragm media resistance MDR 2	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

Dimensions / Circuit Diagrams MDR 2



Pressure switch MDR-2



Accessories MDR 2

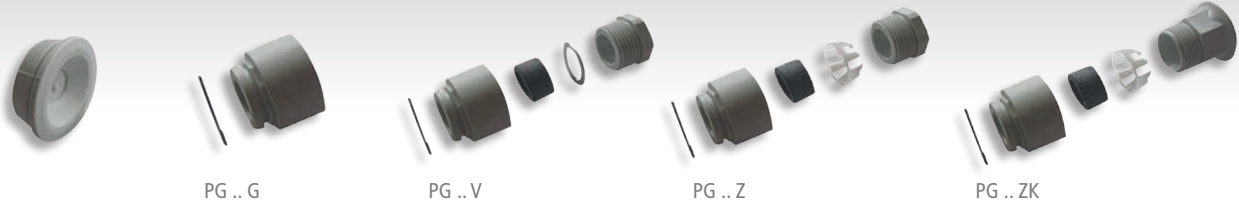
Order reference	Description	Weight (in g)	Part No
Unloader valves			
EV 2	With screw connection for 6 mm plastic or copper discharge tubes	25	200666
EV 2S*	With quick-connect for 6 mm plastic discharge tubes	25	200680
EV 2W	90° with screw connection for 6 mm plastic or discharge copper tubes	25	200697
EV 2Wi	90° with screw connection for 1/4" mm plastic or discharge copper tubes	15	200703
EV 2WS*	90° with quick-connect for 6 mm plastic discharge tubes	15	200710
Delayed unloader valves			
AEV 2	With screw connection for 6 mm plastic or copper discharge tubes	25	200727
AEV 2S*	With quick-connect for 6 mm plastic discharge tubes	25	200741
AEV 2W	90° with screw connection for 6 mm plastic or copper discharge tubes	15	200758
AEV 2Wi	90° with screw connection for 1/4" mm plastic or copper discharge tubes	15	200765
AEV 2WS*	90° with quick-connect for 6 mm plastic discharge tubes	15	200772
Cable glands			
WN	Grommet	6	200888
PG 11 G	Conduits for mounting of cable glands (Inner thread)	6	200895
PG 11 V	Cable gland complete	12	200901
PG 11 Z	With strain relief	12	200925
PG 11 ZK	With strain relief and cable support	12	200918
PG 13,5 G	Conduits for mounting of cable glands (Inner thread)	6	200963
PG 13,5 V	Cable gland complete	12	200932
PG 13,5 Z	With strain relief	12	200956
PG 13,5 ZK	With strain relief and cable support	12	200949
Cover			
H2 (Cover MDR 2)	Cover without On/Off lever	40	217510
H2-EA (Cover MDR 2+EA)	Cover with On/Off lever for manual On/Off	40	229445

*only for pneumatic tubes with outside tolerances according to e. g. Festo PAN 6x1mm

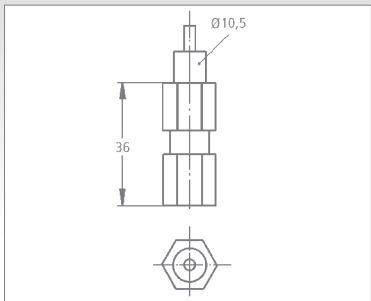
Unloader valves / Delayed unloader valves



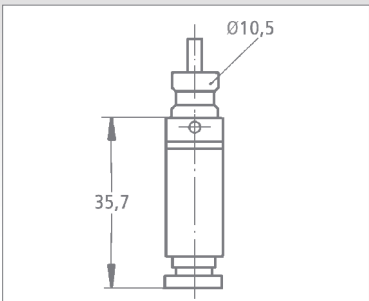
Cable glands MDR 2



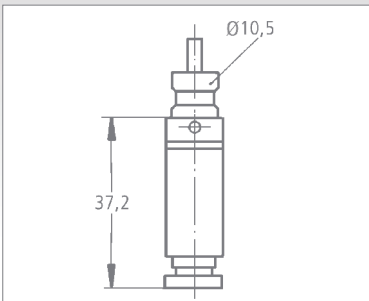
Dimensions, Accessories MDR 2



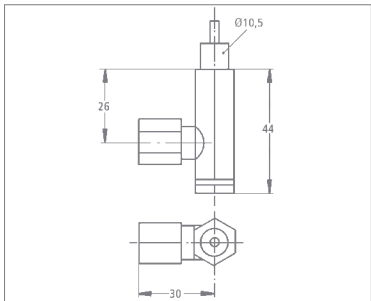
EV 2



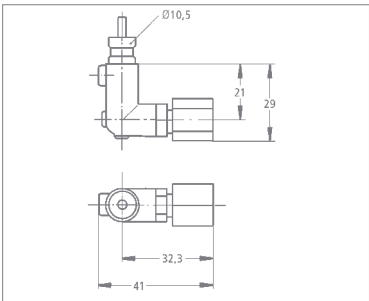
EV 2S



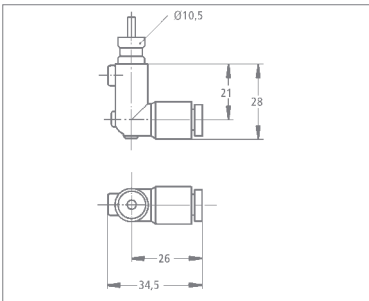
AEV 2S



AEV 2

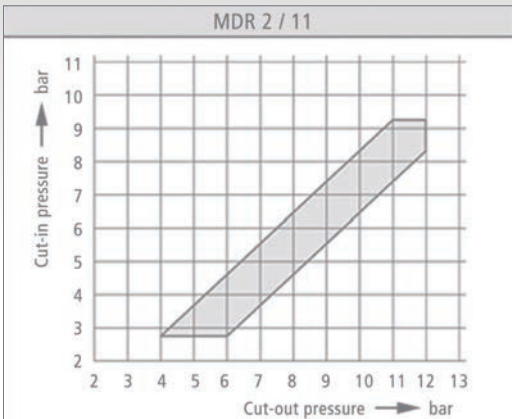
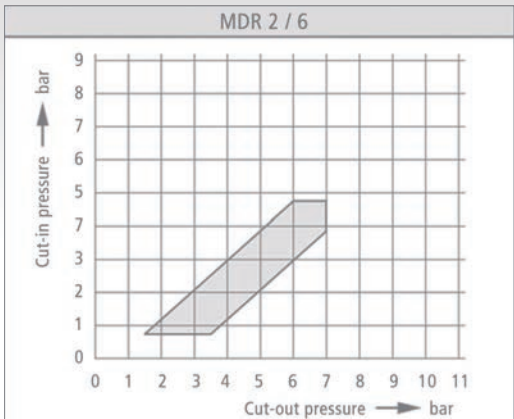


EV 2W / EV 2Wi
AEV 2W / AEV 2Wi



EV 2WS /
AEV 2WS

Pressure Diagrams



Pressure switch MDR 21



- Single phase
- Switching capacity 2.2 kW / 3 HP
- Max. cut-out pressure 12 bar / 175 psi
- 2-pole (N.C.)
- Acc. to EN 60947
- UL / CSA-approval
- Flange = Die-cast aluminium

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 21/6-EA	MDR-21 DBA AACA 015A030 XAA XXX	EA	1,5 - 7	G 1/4" Alu	300	212218
MDR 21/6-EA	MDR-21 DEA AACA 015A030 XAA XXX	EA	1,5 - 7	F4 1/4" Alu	320	212225
MDR 21/11-EA	MDR-21 GBA AACA 070A090 XAA XXX	EA	4 - 12	G 1/4" Alu	300	212232
MDR 21/11-EA	MDR-21 GEA AACA 070A090 XAA XXX	EA	4 - 12	F4 1/4" Alu	320	212249
MDR 21/6	MDR-21 DBA BACA 015A030 XAA XXX	-	1,5 - 7	G 1/4" Alu	300	219910
MDR 21/6	MDR-21 DEA BACA 015A030 XAA XXX	-	1,5 - 7	F4 1/4" Alu	320	226901
MDR 21/11	MDR-21 GBA BACA 070A090 XAA XXX	-	4 - 12	G 1/4" Alu	300	226918
MDR 21/11	MDR-21 GEA BACA 070A090 XAA XXX	-	4 - 12	G F4 1/4" Alu	320	226925

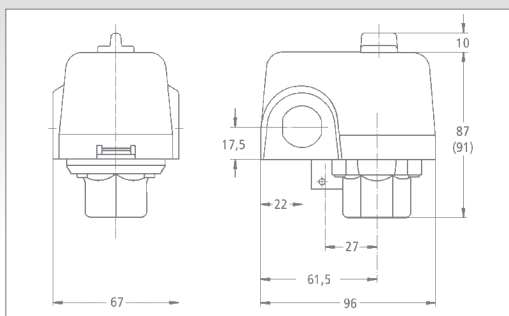
Unloader valves and cable glands for retrofitting, see accessories!

Technical Data MDR 21 nach EN 60947 UL/CSA	
Rated insulation voltage U _i	500 V
Motor switching capacity (UL 508, CSA 22.2) U _e =120 V (1~)	2 HP
Motor switching capacity (UL 508, CSA 22.2) U _e =240 V (1~)	3 HP
Motor switching capacity (AC 3) Cycles	2,2 kW
Electrical life (AC 3) Cycles	> 1 x 10 ⁵
Mechanical life Cycles	> 5 x 10 ⁶
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	600
Rated operational current I _e (UL 508, CSA 22.2) at 240 V AC / 120 V AC	17 A / 24 A
Bursting strength P _z	> 35 bar

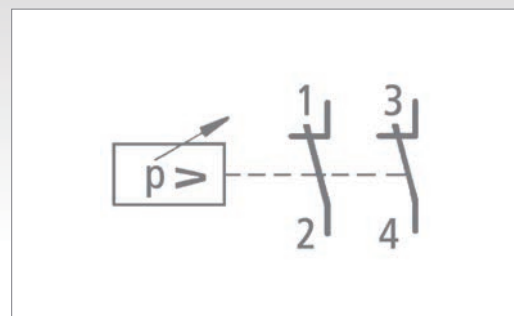
Technical Data MDR 21 nach EN 60947 UL/CSA	
Permissible medium temperature Air	- 5...+ 80 °C
Permissible medium temperature Water	+ 80 °C
Degree of Protection acc. to EN 60529	IP 44
Conductor cross-section 1 ... fine stranded cable 1 x / 2 x	2,5 / 2,5 mm ²
Conductor cross-section 1 ... rigid cable 1 x / 2 x	2,5 / 2,5 mm ²

Diaphragm media resistance MDR 21	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

Dimensions / Circuit Diagrams MDR 21



Pressure switch MDR 21



Pressure switch MDR 21

Accessories MDR 21

Order reference	Description	Weight (in g)	Part No.
Unloader valves			
EV 2	With screw connection for 6 mm plastic or copper discharge tubes	25	200666
EV 2S*	With quick-connect for 6 mm plastic discharge tubes	25	200680
EV 2W	90° with screw connection for 6 mm plastic or discharge copper tubes	15	200697
EV 2Wi	90° with screw connection for 1/4" mm plastic or discharge copper tubes	15	200703
EV 2WS*	90° with quick-connect for 6 mm plastic discharge tubes	15	200710
Delayed unloader valves			
AEV 2	With screw connection for 6 mm plastic or copper discharge tubes	25	200727
AEV 2S*	With quick-connect for 6 mm plastic discharge tubes	25	200741
AEV 2W	90° with screw connection for 6 mm plastic or copper discharge tubes	15	200758
AEV 2Wi	90° with screw connection for 1/4" mm plastic or copper discharge tubes	15	200765
AEV 2WS*	90° with quick-connect for 6 mm plastic discharge tubes	15	200772
Cable glands			
WN	Grommet	6	201243
PG 13,5 Z-21	With strain relief	12	201021
PG 13,5 ZK-21	With strain relief and cable support	12	201038
Cover			
H 21 (Cover MDR 21)	Cover without On/Off lever (Neutral version without marking)	40	229452
H 21-EA (Cover MDR 2+EA)	Cover with On/Off lever for manual On/Off (neutral version, without marking)	40	217503

* only for pneumatic tubes with outside tolerances according to e. g. Festo PAN 6x1mm

High performance
Pressure switches

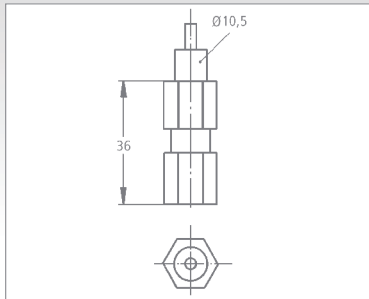
Unloader valves / Delayed unloader valves



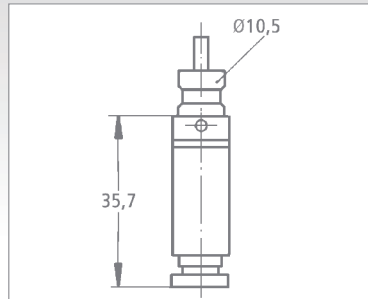
Cable glands MDR 21



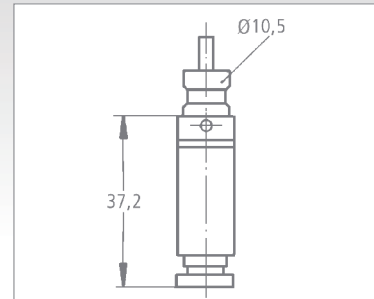
Dimensions, Accessories MDR 21



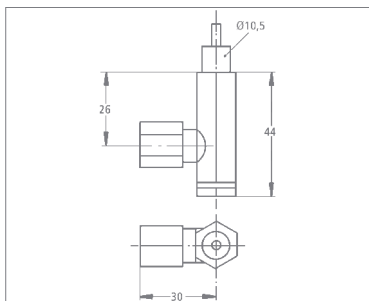
EV 2



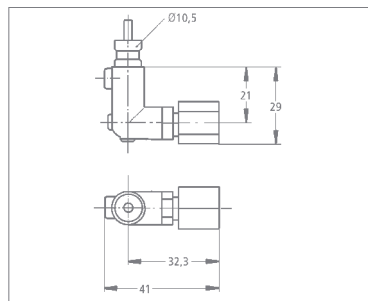
EV 25



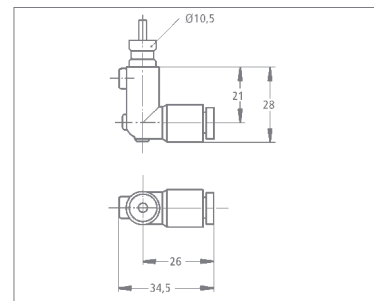
AEV 25



AEV 2

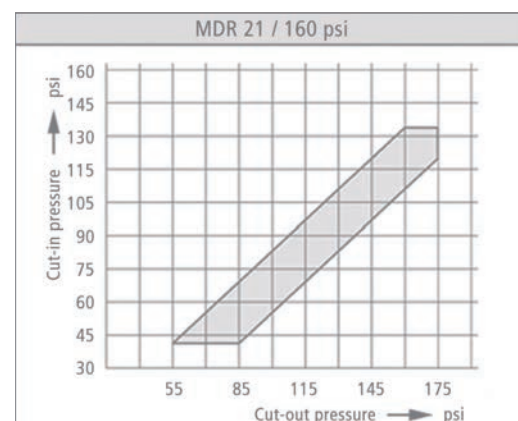
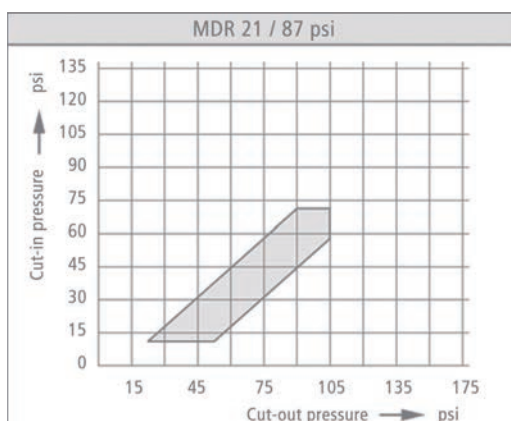
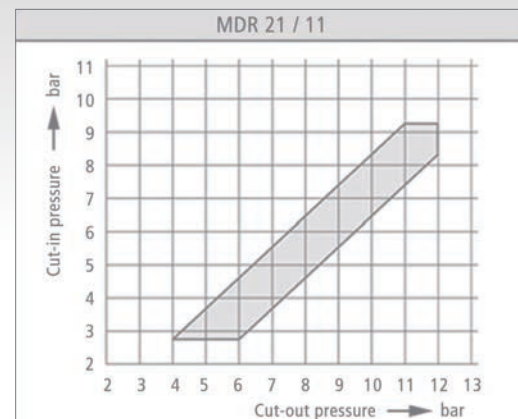
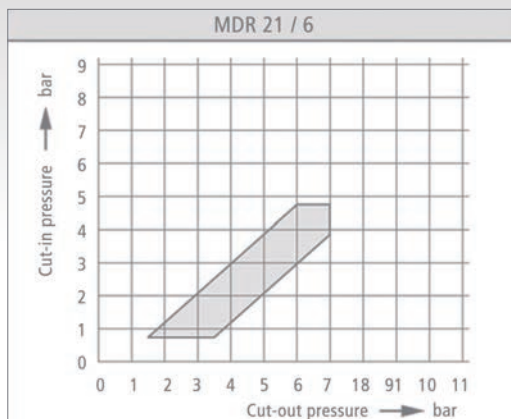


EV 2W / EV 2Wi
AEV 2W / AEV 2Wi



EV 2WS /
AEV 2WS

Pressure Diagrams



1 bar = 14,5 psi; 10 psi = ca. 0,7 bar

Pressure switch MDR 3

Pressure switch MDR 3



- 3-phase
- Switching capacity 7.5 (11) kW / 20 HP
- Available with overload relay
- Max. cut-out pressure 35 bar
- 3-pole (N.C.)
- Acc. to EN 60947
- UL / CSA-approval optional
- Flange = Die-cast aluminium

- Available with scale
- Available with auxiliary switch



High performance
Pressure switches

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 3/6-EA	MDR-3 DAA AAAA 045A060 XAA XXX	EA	1,3 - 6	G 1/2" Alu	610	212256
MDR 3/11-EA	MDR-3 GAA AAAA 090A110 XAA XXX	EA	4 - 11	G 1/2" Alu	610	212263
MDR 3/11-EA	MDR-3 GBA AAAA 090A110 XAA XXX	EA	4 - 11	G 1/4" Alu	610	212270
MDR 3/11-EA	MDR-3 GEA AAAA 090A110 XAA XXX	EA	4 - 11	F4 1/4" Alu	640	212287
MDR 3/11-EA	MDR-3 GDA AAAA 090A110 XAA XXX	EA	4 - 11	F4 1/2" Alu	640	212294
MDR 3/11-EA	MDR-3 GFA AAAA 090A110 XAA XXX	EA	4 - 11	F4 3/8" Alu	640	212300
MDR 3/16-EA	MDR-3 HAA AAAA 130A160 XAA XXX	EA	6 - 16	G 1/2" Alu	610	212317
MDR 3/16-EA	MDR-3 HBA AAAA 130A160 XAA XXX	EA	6 - 16	G 1/4" Alu	610	212324
MDR 3/16-EA	MDR-3 HEA AAAA 130A160 XAA XXX	EA	6 - 16	F4 1/4" Alu	640	212331
MDR 3/16-EA	MDR-3 HDA AAAA 130A160 XAA XXX	EA	6 - 16	F4 1/2" Alu	640	212348
MDR 3/16-EA	MDR-3 HFA AAAA 130A160 XAA XXX	EA	6 - 16	F4 3/8" Alu	640	212355
MDR 3/25-EA	MDR-3 IAA AAAA 215A250 XAA XXX	EA	7,5 - 25	G 1/2" Alu	610	212362
MDR 3/25-EA	MDR-3 IDA AAAA 215A250 XAA XXX	EA	7,5 - 25	F4 1/2" Alu	640	212379
MDR 3/35-EA	MDR-3 JAA AAAA 320A350 XAA XXX	EA	12 - 35	G 1/2" Alu	610	229711
MDR 3/35-EA	MDR-3 JDA AAAA 320A350 XAA XXX	EA	12 - 35	F4 1/2" Alu	640	229728
MDR 3/6	MDR-3 DAA BAAA 045A060 XAA XXX	-	1,3 - 6	G 1/2" Alu	590	226932
MDR 3/11	MDR-3 GAA BAAA 090A110 XAA XXX	-	4 - 11	G 1/2" Alu	590	226949
MDR 3/11	MDR-3 GBA BAAA 090A110 XAA XXX	-	4 - 11	G 1/4" Alu	590	226956
MDR 3/11	MDR-3 GEA BAAA 090A110 XAA XXX	-	4 - 11	F4 1/4" Alu	620	226963
MDR 3/11	MDR-3 GDA BAAA 090A110 XAA XXX	-	4 - 11	F4 1/2" Alu	620	226970
MDR 3/11	MDR-3 GFA BAAA 090A110 XAA XXX	-	4 - 11	F4 3/8" Alu	620	226987
MDR 3/16	MDR-3 HAA BAAA 130A160 XAA XXX	-	6 - 16	G 1/2" Alu	590	226994
MDR 3/16	MDR-3 HBA BAAA 130A160 XAA XXX	-	6 - 16	G 1/4" Alu	590	227007
MDR 3/16	MDR-3 HEA BAAA 130A160 XAA XXX	-	6 - 16	F4 1/4" Alu	620	227014
MDR 3/16	MDR-3 HDA BAAA 130A160 XAA XXX	-	6 - 16	F4 1/2" Alu	620	227021
MDR 3/16	MDR-3 HFA BAAA 130A160 XAA XXX	-	6 - 16	F4 3/8" Alu	620	227038
MDR 3/25	MDR-3 IAA BAAA 215A250 XAA XXX	-	7,5 - 25	G 1/2" Alu	590	227045
MDR 3/25	MDR-3 IDA BAAA 215A250 XAA XXX	-	7,5 - 25	F4 1/2" Alu	620	227052
MDR 3/35	MDR-3 JAA BAAA 320A350 XAA XXX	-	12 - 35	G 1/2" Alu	590	229698
MDR 3/35	MDR-3 JDA BAAA 320A350 XAA XXX	-	12 - 35	F4 1/2" Alu	620	229704

Unloader valves and cable glands for retrofitting, see accessories!

Type overview Pressure Switch MDR 3 RM versions, with roller diaphragm - tight pressure differential, extended medium resistance

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 3/6-RM	MDR-3 DAB BAAA 028A035 XAA XXX	-	1 - 6	G 1/2" Alu	770	229674
MDR 3/10-RM	MDR-3 GAB BAAA 060A070 XAA XXX	-	3 - 10	G 1/2" Alu	770	227595
MDR 3/10-RM	MDR-3 GOB BAAA 060A070 XAA XXX	-	3 - 10	G1/2" + G 1/4" Alu	810	227601
MDR 3/10-RM-EA	MDR-3 GAB AAAA 060A070 XAA XXX	EA	3 - 10	G 1/2" Alu	800	227632
MDR 3/10-RM-EA	MDR-3 GOB AAAA 060A070 XAA XXX	EA	3 - 10	G 1/2" + G1/4" Alu	850	227649
MDR 3/16-RM	MDR-3 HAB BAAA 145A160 XAA XXX	-	5 - 16	G 1/2" Alu	770	227618
MDR 3/16-RM	MDR-3 HOB BAAA 145A160 XAA XXX	-	5 - 16	G 1/2" + G 1/4" Alu	810	227625
MDR 3/16-RM-EA	MDR-3 HAB AAAA 145A160 XAA XXX	EA	5 - 16	G 1/2" Alu	800	227656
MDR 3/16-RM-EA	MDR-3 HOB AAAA 145A160 XAA XXX	EA	5 - 16	G 1/2" + G1/4" Alu	850	227663

Unloader valves and cable glands for retrofitting, see accessories!

Technical Data MDR 3 acc. to EN 60947, UL / CSA	
Rated insulation voltage U_i	690 V
Motor switching capacity (UL 508, CSA 22.2) $U_e=120\text{ V (1~)}$	2 HP
Motor switching capacity (AC3) $U_e=240\text{ V (1~)}$	2,2 kW
Motor switching capacity (UL 508, CSA 22.2) $U_e=240\text{ V (1~)}$	3 HP
Motor switching capacity (AC 3) $U_e=240\text{ V (3~)}$	5,5 kW
Motor switching capacity (UL 508, CSA 22.2) $U_e=240\text{ V (3~)}$	7,5 HP
Motor switching capacity (AC 3) $U_e=400\text{ V (3~)}$	7,5/11* kW
Motor switching capacity (UL 508, CSA 22.2) $U_e=480\text{ V (3~)}$	15 HP
Motor switching capacity (AC 3) $U_e=500\text{ V (3~)}$	7,5/11* kW
Motor switching capacity (UL 508, CSA 22.2) $U_e=600\text{ V (3~)}$	20 HP
Motor switching capacity (AC 3) $U_e=690\text{ V (3~)}$	7,5/15* kW

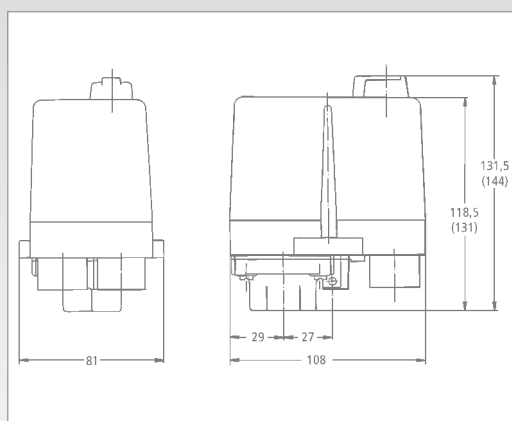
Diaphragm media resistance MDR 3	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

*) with Arc-chamber SK..H on request

Technical Data MDR 3 acc. to EN 60947, UL / CSA	
Electrical life (AC 3) Cycles	$> 1 \times 10^5$
Mechanical life Cycles	$> 1 \times 10^6$
Max. electrical cycles cycles / h	120
Max. mechanical cycles cycles / h	600
Rated operational current I_e the bei 690 V AC 3	24 A
Bursting strength P_z	$\leq 16 > 40\text{ bar}$ $\geq 25 > 60\text{ bar}$
Permissible medium temperature Air	-5...+ 80 °C
Permissible medium temperature Water	+ 80 °C
Degree of Protection acc to EN 60529	IP 54
Conductor cross-section 1 .. fine stranded cable 1 x / 2 x	4 / 2,5 mm ²
Conductor cross-section 1 .. rigid cable 1 x / 2 x	6 / 4 mm ²

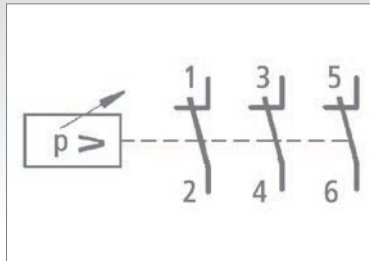
Diaphragm media resistance MDR 3 USA	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

Dimensions MDR 3

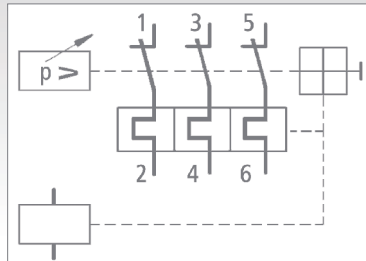


Pressure switch MDR-3

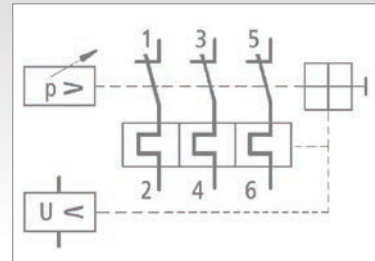
Circuit Diagrams MDR 3



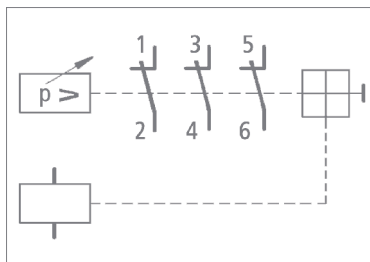
MDR 3



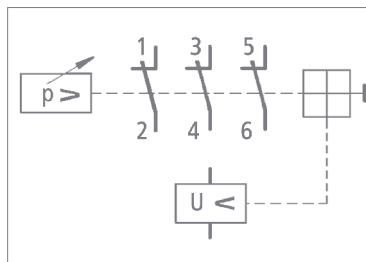
MDR 3 EA 3 R 3 RA 3



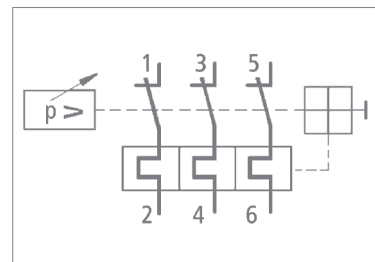
MDR 3 EA 3 R 3 RU 3



MDR 3 EA 3 RA 3



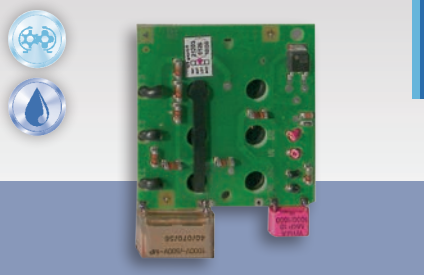
MDR 3 EA 3 RU 3



MDR 3 EA 3 R 3

Accessory DPA-Board for MDR 3

(Use only with MDR-3..E/A and RU 3/400-50; article-nr. 201557)



Description

Installing the DPA - circuit board onto MDR 3, the pressure switch offers the following additional functions:

- Phase sequence control
- Phase failure detection
- Supervision of an external opener possible, e. g. Klixon for temperature
- supervision (clamp tension < 230 V)
- Undervoltage release

For all functions the neutral conductor is not necessary. In case of malfunction the pressure switch will be switched off. Only upon solving the malfunction, the pressure switch can be switched on again.

Field of application: place-variable compressors, building site-area etc.

Order reference	Description	Voltage	Packing (units)	Part No.
DPA-Board	Phase sequence, phase drop protection board	400 V / 50 Hz	1	258520

Accessories Hourmeter kit MDR 3



Description

The MDR 3 can be equipped or retrofitted with an operating hourmeter to monitor the pump and compressor running time. The hourmeter is available as a kit and can be attached to the cover in 4 different positions, each offset at an angle of 90°.

This ensures optimum readability. The kit consists of an operating hourmeter for either 230 V / 400 V or with battery supplied and a perforated MDR 3 cover with or without ON/OFF lever.

Order reference	Description	Voltage	Packing (units)	Part No.
H3 - B 230	Hourmeter and Cover for MDR-3	230 V / 50 Hz	1	237297
H3 - B 400	Hourmeter and Cover for MDR-3	400 V / 50 Hz	1	237303
H3-EA - B 230	Hourmeter and Cover for MDR-3+EA	230 V / 50 Hz	1	237310
H3-EA - B 400	Hourmeter and Cover for MDR-3+EA	400 V / 50 Hz	1	237327
H3-B	Hourmeter and Cover for MDR-3	battery supplied	1	274308
H3-EA-B	Hourmeter and Cover for MDR-3+EA	battery supplied	1	274315

can be used at 60 Hz with higher engine speed

Accessories MDR 3

Order reference	Description	Weight (in g)	Part No.
Unloader valves			
EV 3	With screw connection for 6 mm plastic or copper discharge tubes	25	201045
EV 3i	With screw connection for 1/4" plastic or copper discharge tubes	25	201052
EV 3S ^{1) 2)}	With quick-connect for 6 mm plastic discharge tubes	25	201069
EV 3W ¹⁾	90° unloader valve with screw connection for 6 mm plastic or copper discharge tubes	18	201076
EV 3Wi ¹⁾	90° unloader valve with screw connection for 1/4" plastic or copper discharge tubes	18	201083
EV 3WS ^{1) 2)}	90° unloader valve with quick-connect for 6 mm plastic discharge tubes	10	201090
EV 3L	With screw connection for 6 mm plastic or copper discharge tubes	30	201229
Delayed unloader valves			
AEV 3	With screw connection for 6 mm plastic or copper discharge tubes	25	201106
AEV 3S ^{1) 2)}	With quick-connect for 6 mm plastic discharge tubes	25	201120
AEV 3W ¹⁾	90° unloader valve with screw connection for 6 mm plastic or copper discharge tubes	18	201137
AEV 3Wi ¹⁾	90° unloader valve with screw connection for 1/4" plastic or copper discharge tubes	18	201144
AEV 3WS ^{1) 2)}	90° unloader valve with quick-connect for 6 mm plastic discharge tubes	10	201151
Cable glands			
PG 9 Z	With strain relief (for additional wiring)	12	201373
WN	Grommet	6	201243
PG 11 G	Conduits for mounting of cable glands (Inner thread)	6	201250
PG 11 V	Cable gland complete	12	201267
PG 11 Z	With strain relief	12	201274
PG 11 ZK	With strain relief and cable support	12	201281
PG 13,5 G	Conduits for mounting of cable glands (Inner thread)	6	201298
PG 13,5 V	Cable gland complete	12	201304
PG 13,5 Z	With strain relief	12	201311
PG 13,5 ZK	With strain relief and cable support	12	201328
PG 16 G	Conduits for mounting of cable glands (Inner thread)	6	201335
PG 16 V	Cable gland complete	12	201342
PG 16 Z	With strain relief	12	201359
PG 16 ZK	With strain relief and cable support	18	201366
MW 3	Mounting bracket for MDR 3	65	246138
SC	Scala (only factory)	NEW!	
Cover			
H3 (Cover MDR 3)	Cover without rotary knob (Neutral version, without marking)	100	229490
H3-EA (Cover MDR 3+EA)	Cover with rotary knob for manual On/Off (Neutral version, without marking)	100	230007
Thermal, 3-pole overload relay			
SK 3	Arc-chamber without lock mechanism (supplied as standard with MDR 3...)	90	201380
SK 3-S	SK 3-S Arc-chamber with lock mechanism (supplied as standard with MDR 3...+EA)	110	201397
SK R3/ 1,0	0,63 – 1,00 A	145	201403
SK R3/ 1,6	1,00 – 1,60 A	145	201410
SK R3/ 2,5	1,60 – 2,50 A	145	201427
SK R3/ 4,0	2,50 – 4,00 A	145	201434
SK R3/ 6,3	4,00 – 6,30 A	145	201441
SK R3/ 10,0	6,30 – 10,00 A	145	201458
SK R3/ 16,0	10,00 – 16,00 A	145	201465
SK R3/ 20,0	16,00 – 20,00 A	145	201472
SK R3/ 24,0	20,00 – 24,00 A	145	201489
SK R3/ 30/2	22,00 – 30,00 A, 2-polig	145	201496
HI 3	Auxiliary switch - NC contact for tapping the position of the main switch contacts	10	274971
Undervoltage and shunt releases			
RU 3/24-50	Undervoltage release 24 V, 50 Hz	100	226857
RU 3/230-50	Undervoltage release 230 V, 50 Hz	100	201540
RU 3/400-50	Undervoltage release 400 V, 50 Hz	100	201557
RA 3/24-50	Shunt release 24 V, 50 Hz	100	201564
RA 3/110-50	Shunt release 110 V, 50 Hz	100	201571
RA 3/230-50	Shunt release 230 V, 50 Hz	100	201588
RA 3/240-60	Shunt release 240 V, 60 Hz	100	214113
RA 3/400-50	Shunt release 400 V, 50 Hz	100	225935
RA 3/480-60	Shunt release 480 V, 60 Hz	100	201595

¹⁾ up to ≤ 16 bar

²⁾ only for pneumatic tubes with outside tolerances according to e. g. Festo PAN 6x1mm

Unloader valves / Delayed unloader valves



High performance
Pressure switches

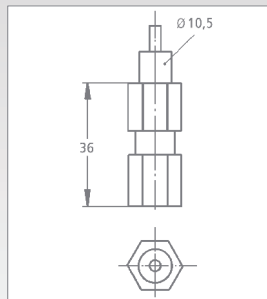
Cable glands MDR 3



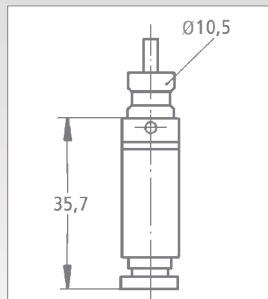
Wall-mounting bracket, 3-pole overload relay, undervoltage and shunt releases



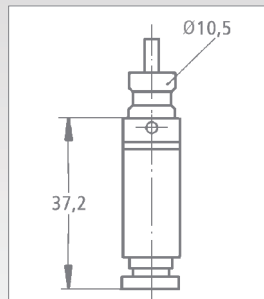
Dimensions, Accessories MDR 3



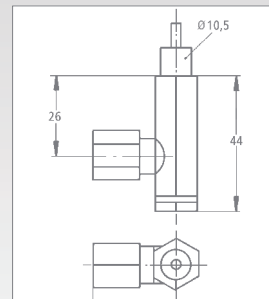
EV 3 / EV 3i



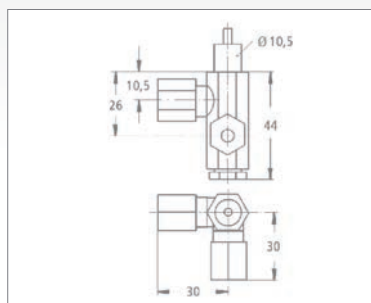
EV 35



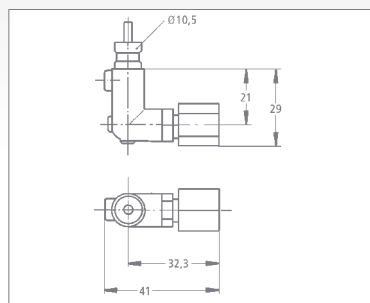
AEV 35



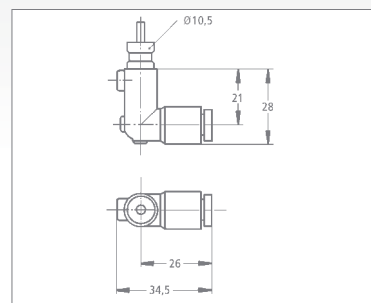
AEV 3



EV 3L

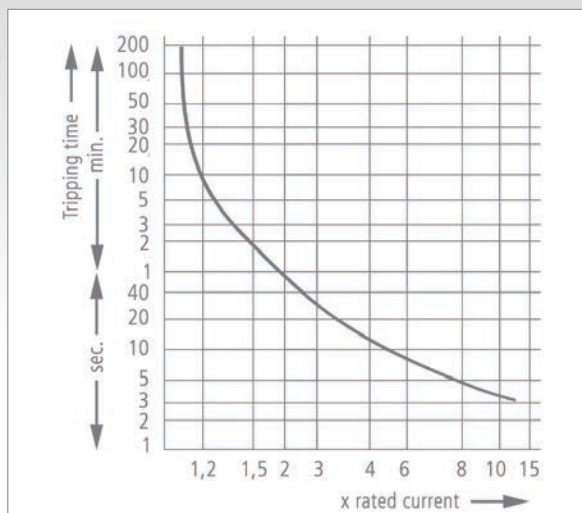


EV 3W / EV 3Wi
AEV 3W / AEV 3Wi

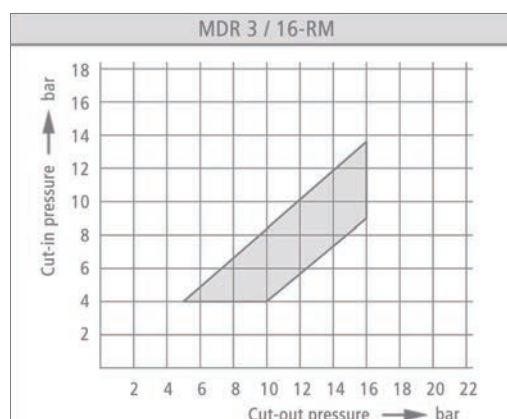
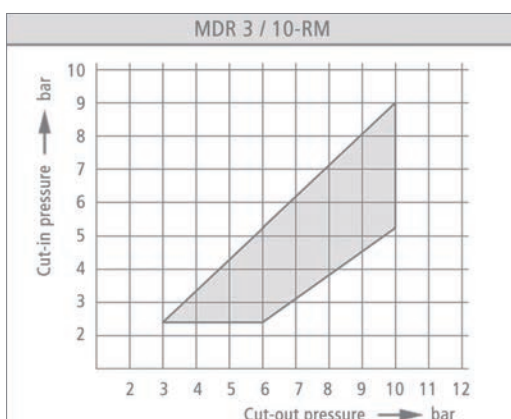
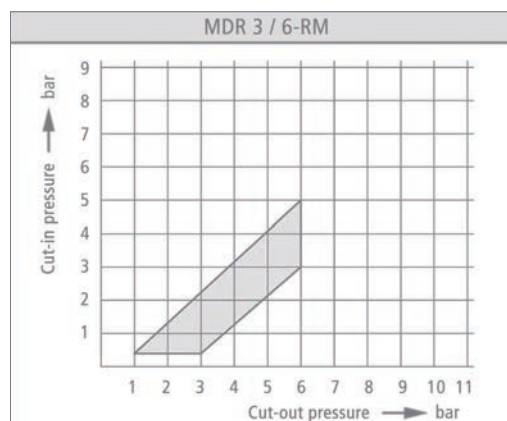
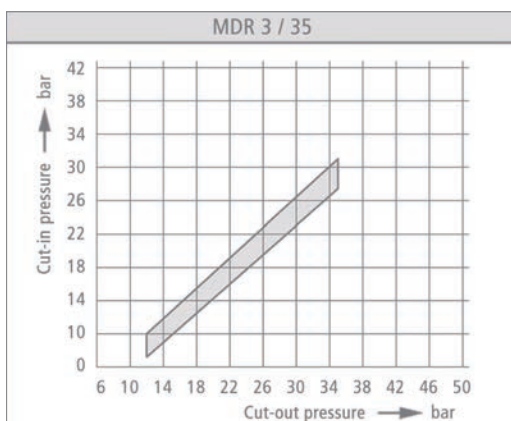
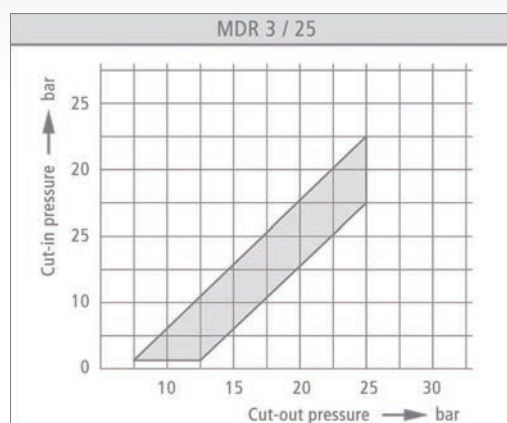
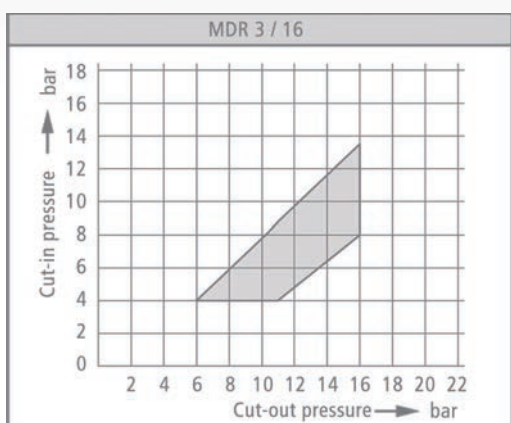
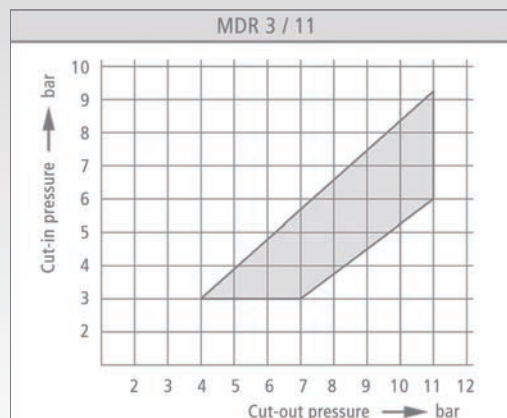
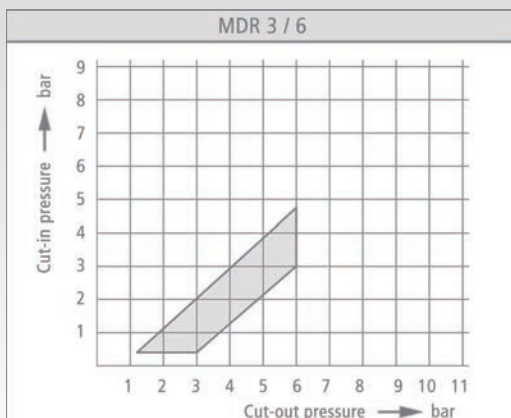


EV 3WS / AEV 3WS

Tripping curves R3 (average)



Pressure Diagrams MDR 3



Pressure switch MDR 4 S



- 3-phase
- Switching capacity 4.0 / 5.5 kW
- Max. cut-out pressure 16 bar
- 3-pole (N.C.)
- Acc. to EN 60947
- 4-way-flange (optional)
- Flange = Die-cast aluminium

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 4S/6-EA	MDR-4 DBA AFAA 040A060 XAA XXX	EA	1,5 - 6	G 1/4" Alu	420	212584
MDR 4S/6-EA	MDR-4 DAA AFAA 040A060 XAA XXX	EA	1,5 - 6	G 1/2" Alu	420	212591
MDR 4S/6-EA	MDR-4 DOA AFAA 040A060 XAA XXX	EA	1,5 - 6	G 1/2" + G 1/4" Alu	460	212607
MDR 4S/6-EA	MDR-4 DEA AFAA 040A060 XAA XXX	EA	1,5 - 6	F4 1/4" Alu	460	257899
MDR 4S/6-EA	MDR-4 DDA AFAA 040A060 XAA XXX	EA	1,5 - 6	F4 1/2" Alu	460	257905
MDR 4S/6-EA	MDR-4 DFA AFAA 040A060 XAA XXX	EA	1,5 - 6	F4 3/8" Alu	460	257912
MDR 4S/11-EA	MDR-4 GBA AFAA 090A110 XAA XXX	EA	4 - 11	G 1/4" Alu	420	212614
MDR 4S/11-EA	MDR-4 GAA AFAA 090A110 XAA XXX	EA	4 - 11	G 1/2" Alu	420	212621
MDR 4S/11-EA	MDR-4 GOA AFAA 095A110 XAA XXX	EA	4 - 11	G 1/2" + G 1/4" Alu	460	212638
MDR 4S/11-EA	MDR-4 GEA AFAA 090A110 XAA XXX	EA	4 - 11	F4 1/4" Alu	460	257929
MDR 4S/11-EA	MDR-4 GDA AFAA 090A110 XAA XXX	EA	4 - 11	F4 1/2" Alu	460	257936
MDR 4S/11-EA	MDR-4 GFA AFAA 090A110 XAA XXX	EA	4 - 11	F4 3/8" Alu	460	257943
MDR 4S/16-EA	MDR-4 HBA AFAA 135A160 XAA XXX	EA	6 - 16	G 1/4" Alu	420	212645
MDR 4S/16-EA	MDR-4 HAA AFAA 135A160 XAA XXX	EA	6 - 16	G 1/2" Alu	420	212652
MDR 4S/16-EA	MDR-4 HOA AFAA 135A160 XAA XXX	EA	6 - 16	G 1/2" + G 1/4" Alu	460	212669
MDR 4S/16-EA	MDR-4 HEA AFAA 135A160 XAA XXX	EA	6 - 16	F4 1/4" Alu	460	257950
MDR 4S/16-EA	MDR-4 HDA AFAA 135A160 XAA XXX	EA	6 - 16	F4 1/2" Alu	460	257967
MDR 4S/16-EA	MDR-4 HFA AFAA 135A160 XAA XXX	EA	6 - 16	F4 3/8" Alu	460	257974
MDR 4S/25-EA	MDR-4 IBA AFAA 210A250 XAA XXX	EA	8,5 - 25	G 1/4" Alu	420	212676
MDR 4S/25-EA	MDR-4 IAA AFAA 210A250 XAA XXX	EA	8,5 - 25	G 1/2" Alu	420	212683
MDR 4S/25-EA	MDR-4 IOA AFAA 210A250 XAA XXX	EA	8,5 - 25	G 1/2" + G 1/4" Alu	460	212690
MDR 4S/25-EA	MDR-4 IEA AFAA 210A250 XAA XXX	EA	8,5 - 25	F4 1/4" Alu	460	263883
MDR 4S/25-EA	MDR-4 IDA AFAA 210A250 XAA XXX	EA	8,5 - 25	F4 1/2" Alu	460	263890
MDR 4S/25-EA	MDR-4 IFA AFAA 210A250 XAA XXX	EA	8,5 - 25	F4 3/8" Alu	460	263906
MDR 4S/6	MDR-4 DBA BFAA 040A060 XAA XXX	-	1,5 - 6	G 1/4" Alu	420	220084
MDR 4S/6	MDR-4 DAA BFAA 040A060 XAA XXX	-	1,5 - 6	G 1/2" Alu	420	220077
MDR 4S/6	MDR-4 DOA BFAA 040A060 XAA XXX	-	1,5 - 6	G 1/2" + G 1/4" Alu	460	220121
MDR 4S/6	MDR-4 DEA BFAA 040A060 XAA XXX	-	1,5 - 6	F4 1/4" Alu	460	257981
MDR 4S/6	MDR-4 DDA BFAA 040A060 XAA XXX	-	1,5 - 6	F4 1/2" Alu	460	257998
MDR 4S/6	MDR-4 DFA BFAA 040A060 XAA XXX	-	1,5 - 6	F4 3/8" Alu	460	258001
MDR 4S/11	MDR-4 GBA BFAA 090A110 XAA XXX	-	4 - 11	G 1/4" Alu	420	204251
MDR 4S/11	MDR-4 GAA BFAA 090A110 XAA XXX	-	4 - 11	G 1/2" Alu	420	206194
MDR 4S/11	MDR-4 GOA BFAA 095A110 XAA XXX	-	4 - 11	G 1/2" + G 1/4" Alu	460	227069
MDR 4S/11	MDR-4 GEA BFAA 090A110 XAA XXX	-	4 - 11	F4 1/4" Alu	460	258018
MDR 4S/11	MDR-4 GDA BFAA 090A110 XAA XXX	-	4 - 11	F4 1/2" Alu	460	258025
MDR 4S/11	MDR-4 GFA BFAA 090A110 XAA XXX	-	4 - 11	F4 3/8" Alu	460	258032
MDR 4S/16	MDR-4 HBA BFAA 135A160 XAA XXX	-	6 - 16	G 1/4" Alu	420	204244
MDR 4S/16	MDR-4 HAA BFAA 135A160 XAA XXX	-	6 - 16	G 1/2" Alu	420	220107
MDR 4S/16	MDR-4 HOA BFAA 135A160 XAA XXX	-	6 - 16	G 1/2" + G 1/4" Alu	460	227076
MDR 4S/16	MDR-4 HEA BFAA 135A160 XAA XXX	-	6 - 16	F4 1/4" Alu	460	258049
MDR 4S/16	MDR-4 HDA BFAA 135A160 XAA XXX	-	6 - 16	F4 1/2" Alu	460	258056
MDR 4S/16	MDR-4 HFA BFAA 135A160 XAA XXX	-	6 - 16	F4 3/8" Alu	460	258063
MDR 4S/25	MDR-4 IBA BFAA 210A250 XAA XXX	-	8,5 - 25	G 1/4" Alu	420	227083
MDR 4S/25	MDR-4 IAA BFAA 210A250 XAA XXX	-	8,5 - 25	G 1/2" Alu	420	227090
MDR 4S/25	MDR-4 IOA BFAA 210A250 XAA XXX	-	8,5 - 25	G 1/2" + G 1/4" Alu	460	221210
MDR 4S/25	MDR-4 IEA BFAA 210A250 XAA XXX	-	8,5 - 25	F4 1/4" Alu	460	263913
MDR 4S/25	MDR-4 IDA BFAA 210A250 XAA XXX	-	8,5 - 25	F4 1/2" Alu	460	263920
MDR 4S/25	MDR-4 IFA BFAA 210A250 XAA XXX	-	8,5 - 25	F4 3/8" Alu	460	263937

Unloader valves and cable glands for retrofitting, see accessories!

Pressure switch MDR 4 SD



- 3-phase
- Switching capacity 4.0 / 5.5 kW
- Max. cut-out pressure 11 bar
- With scale and transparent cover
- 3-pole (N.C.)
- Acc. to EN 60947
- Flange = Die-cast aluminium

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 4 SD/6	MDR-4 DAA BFDA 040A060 XAA XXX	-	1,5 - 6	G 1/2" Alu	420	212737
MDR 4 SD/6	MDR-4 DBA BFDA 040A060 XAA XXX	-	1,5 - 6	G 1/4" Alu	420	212744
MDR 4 SD/11	MDR-4 GAA BFDA 090A110 XAA XXX	-	4 - 11	G 1/2" Alu	420	212751
MDR 4 SD/11	MDR-4 GBA BFDA 090A110 XAA XXX	-	4 - 11	G 1/4" Alu	420	212768

Unloader valves and cable glands for retrofitting, see accessories!

Pressure switch MDR 4 SU



- 3-phase
- Switching capacity 2.5 / 4.0 kW
- Max. cut-out pressure 16 bar
- With reversed function
- 3-pole (N.O.)
- Acc. to EN 60947
- Flange = Die-cast aluminium

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 4 SU/6	MDR-4 DAA BFCA 040A060 XAA XXX	-	1,5 - 6	G 1/2" Alu	420	212706
MDR 4 SU/11	MDR-4 GAA BFCA 090A110 XAA XXX	-	4 - 11	G 1/2" Alu	420	212713
MDR 4 SU/16	MDR-4 HAA BFCA 090A110 XAA XXX	-	6 - 16	G 1/2" Alu	420	212720

Unloader valves and cable glands for retrofitting, see accessories!

Pressure switch MDR 4

Technical Data MDR 4 S / MDR 4 SD acc. to EN 60947	
Rated insulation voltage U_i	500 V
Motor switching capacity (AC 3) $U_e=240$ V (1~)	2,5 kW
Motor switching capacity (AC 3) $U_e=230$ V (3~)	4,0 kW
Motor switching capacity (AC 3) $U_e=400$ V (3~)	5,5 kW
Motor switching capacity (AC 3) $U_e=500$ V (3~)	5,5 kW
Electrical life (AC 3) $U_e=240$ V (3~)	$> 1 \times 10^5$
Mechanical life Cycles	$> 5 \times 10^5$
Max. electrical cycles Cycles/h	120

Technical Data MDR 4 SU acc. to EN 60947	
Rated insulation voltage U_i	500 V
Motor switching capacity (AC 3) $U_e=240$ V (1~)	1,5 kW
Motor switching capacity (AC 3) $U_e=230$ V (3~)	2,5 kW
Motor switching capacity (AC 3) $U_e=400$ V (3~)	4,0 kW
Electrical life (AC 3) Cycles	$> 1 \times 10^5$
Mechanical life Cycles	$> 5 \times 10^5$
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	600
Rated operational current I_e at 400 V AC	12 A
Bursting strength P_z	> 35 bar

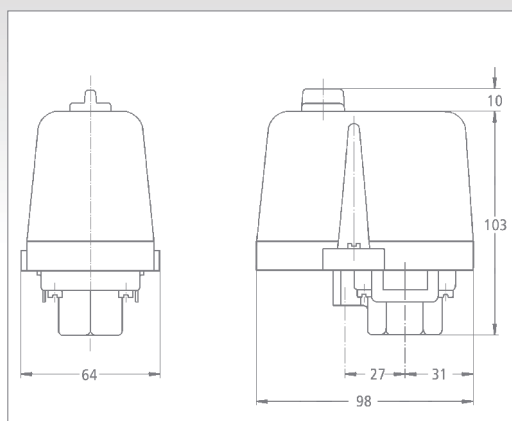
Technical Data MDR 4 S / MDR 4 SD acc. to EN 60947	
Max. mechanical cycles Cycles/h	600
Rated operational current I_e at 400 V AC/500 VAC 3	16 A / 9 A
Bursting strength P_z	> 35 bar
Permissible medium temperature Air	- 5...+ 80 °C
Permissible medium temperature Water	+ 80 °C
Degree of Protection acc. to EN 60529	IP 44
Conductor cross-section 1 ... fine stranded cable 1 x / 2 x	2,5 / 2,5mm ²
Conductor cross-section 1 ... rigid cable 1 x / 2 x	2,5 / 2,5mm ²

Technical Data MDR 4 SU acc. to EN 60947	
Permissible medium temperature Air	- 5...+ 80 °C
Permissible medium temperature Water	+ 80 °C
Degree of Protection acc. to EN 60529	IP 44
Conductor cross-section 1 ... fine stranded cable 1 x / 2 x	2,5 / 2,5mm ²
Conductor cross-section 1 ... rigid cable 1 x / 2 x	2,5 / 2,5mm ²

Diaphragm media resistance MDR 4	
Air, Water	resistant

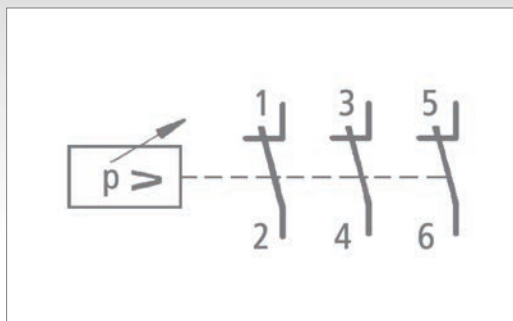
Diaphragm media resistance MDR 4	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

Dimensions MDR 4

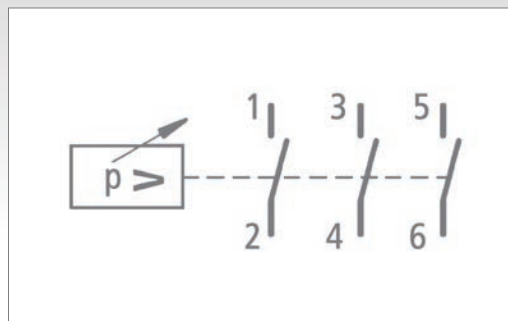


Pressure switch MDR 4

Circuit Diagrams MDR 4



MDR 4 S MDR 4 SD



MDR 4 SU

Accessories MDR 4

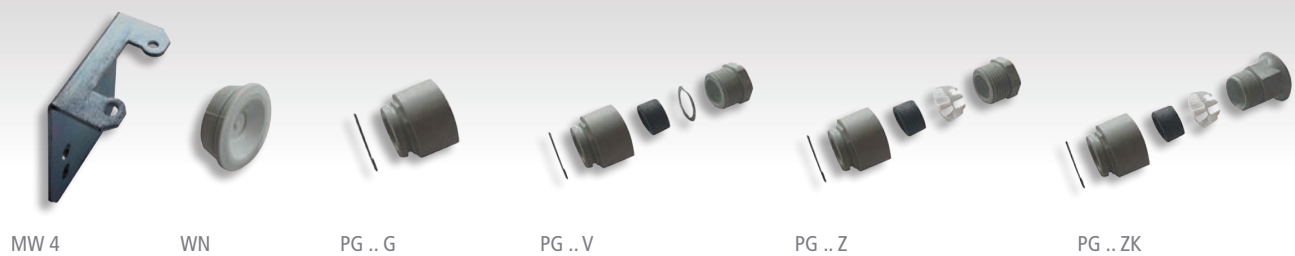
Order reference	Description	Weight (in g)	Part No
Unloader valves			
EV 4	With screw connection for 6 mm plastic or copper discharge tubes	25	201601
EV 4S ¹⁾²⁾	With quick-connect for 6 mm plastic discharge tubes	25	201625
EV 4W ¹⁾	90° with screw connection for 6 mm plastic or discharge copper tubes	15	255055
EV 4Wi ¹⁾	90° with screw connection for 1/4" mm plastic or discharge copper tubes	15	255062
EV 4WS ¹⁾²⁾	90° with quick-connect for 6 mm plastic discharge tubes	15	201656
Delayed unloader valves			
AEV 4	With screw connection for 6 mm plastic or copper discharge tubes	25	201663
AEV 4S ¹⁾²⁾	With quick-connect for 6 mm plastic discharge tubes	25	201687
AEV 4W ¹⁾	90° with screw connection for 6 mm plastic or copper discharge tubes	15	201694
AEV 4Wi ¹⁾	90° with screw connection for 1/4" mm plastic or copper discharge tubes	15	255079
AEV 4WS ¹⁾²⁾	90° with quick-connect for 6 mm plastic discharge tubes	15	255086
Cable glands			
WN	Grommet	6	200888
PG 11 G	Conduits for mounting of cable glands (Inner thread)	6	200895
PG 11 V	Cable gland complete	12	200901
PG 11 Z	With strain relief	12	200925
PG 11 ZK	With strain relief and cable support	12	200918
PG 13,5 G	Conduits for mounting of cable glands (Inner thread)	6	200963
PG 13,5 V	Cable gland complete	12	200932
PG 13,5 Z	With strain relief	12	200956
PG 13,5 ZK	With strain relief and cable support	12	200949
MW 4			
MW 4	Mounting bracket for MDR 4 and MDR 43	65	230021
Cover			
H4 (Cover MDR 4S)	Cover without rotary knob (Neutral version, without marking)	70	229469
H4S-EA (Cover MDR 4S+EA)	Cover with rotary knob for manual On/Off (Neutral version, without marking)	70	229476
H4SD (Cover MDR 4SD)	Cover without rotary knob for MDR 4 SD (transparent)	70	229483

1) up to ≤16 bar, 2) only for pneumatic tubes with outside tolerances according to e. g. Festo PAN 6x1mm

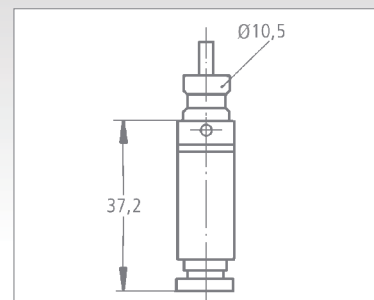
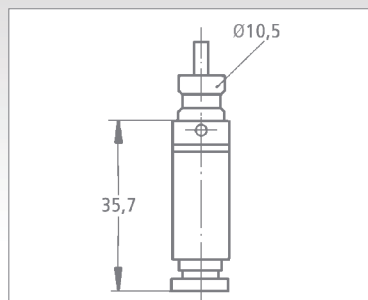
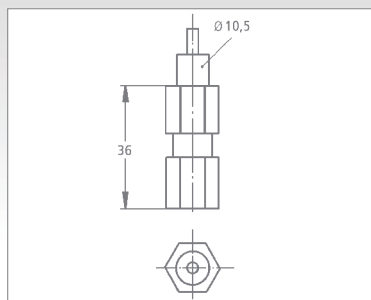
Unloader valves / Delayed unloader valves



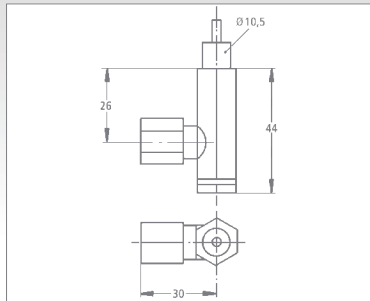
Wall-mounting bracket / Cable glands MDR 4



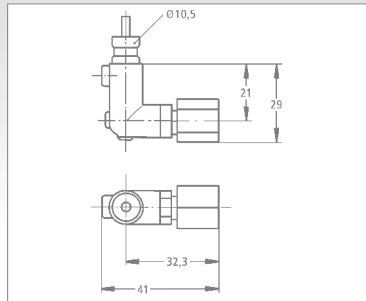
Dimensions, Accessories MDR 4



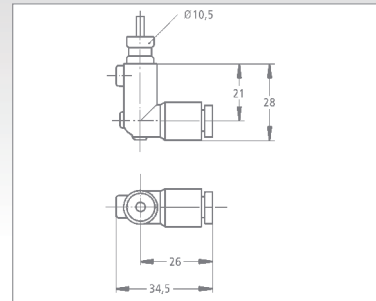
Dimensions, Accessories MDR 4



EV 4

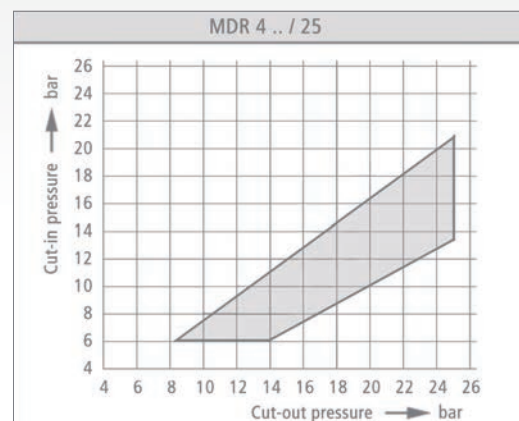
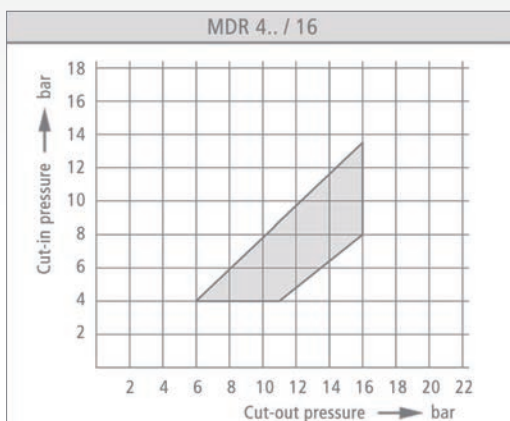
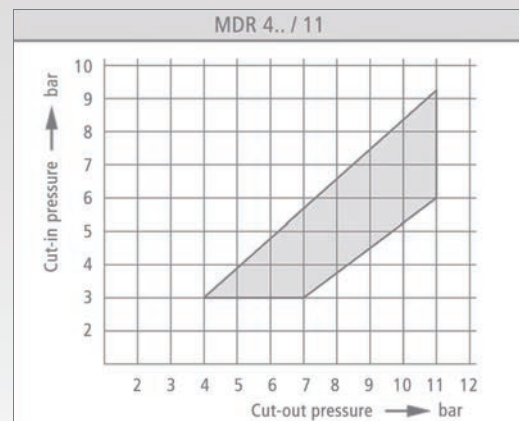
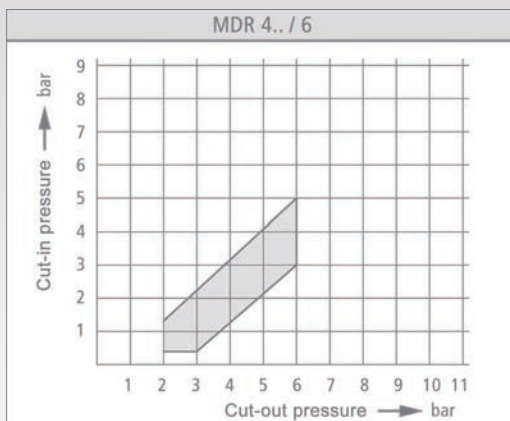


EV 4S



AEV 4S

Pressure Diagrams MDR 4



Pressure switch MDR 5



- 3-phase
- Switching capacity 5.5 kW
- Available with overload relay
- Max. cut-out pressure 45 bar
- 3-pole (N.C.)
- Acc. to EN 60947
- Flange = Die-cast aluminium



Video - Pressure switch settings
MDR 5 / 8

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 5/5	MDR-5 CAA BAAA 015A030 XXX XXX	-	1,5 - 5	G 1/2" Alu	820	212850
MDR 5/5-K	MDR-5 CAA AAAA 015A030 XXX XXX	K*	1,5 - 5	G 1/2" Alu	860	212867
MDR 5/5	MDR-5 COA BAAA 015A030 XXX XXX	-	1,5 - 5	G1/2" + G1/4" Alu	860	212874
MDR 5/5-K	MDR-5 COA AAAA 015A030 XXX XXX	K*	1,5 - 5	G1/2" + G1/4" Alu	900	212881
MDR 5/8	MDR-5 EAA BAAA 070A080 XXX XXX	-	2 - 8	G 1/2" Alu	820	212898
MDR 5/8-K	MDR-5 EAA AAAA 070A080 XXX XXX	K*	2 - 8	G 1/2" Alu	860	212904
MDR 5/8	MDR-5 EOA BAAA 070A080 XXX XXX	-	2 - 8	G 1/2" + G 1/4" Alu	860	212911
MDR 5/8-K	MDR-5 EOA AAAA 070A080 XXX XXX	K*	2 - 8	G 1/2" + G 1/4" Alu	900	212928
MDR 5/11	MDR 5 GAA BAAA 090A110 XXX XXX	-	2 - 11	G 1/2" Alu	820	212935
MDR 5/11-K	MDR-5 GAA AAAA 090A110 XXX XXX	K*	2 - 11	G 1/2" Alu	860	212942
MDR 5/11	MDR-5 GOA BAAA 090A110 XXX XXX	-	2 - 11	G1/2" + G1/4" Alu	860	212959
MDR 5/11-K	MDR-5 GOA AAAA 090A110 XXX XXX	K*	2 - 11	G1/2" + G1/4" Alu	900	212966
MDR 5/16	MDR-5 HAA BAAA 130A160 XXX XXX	-	2,5 - 16	G 1/2" Alu	820	212973
MDR 5/16-K	MDR-5 HAA AAAA 130A160 XXX XXX	K*	2,5 - 16	G 1/2" Alu	860	212980
MDR 5/16	MDR 5 HOA BAAA 130A160 XXX XXX	-	2,5 - 16	G1/2" + G1/4" Alu	860	212997
MDR 5/16-K	MDR-5 HOA AAAA 130A160 XXX XXX	K*	2,5 - 16	G1/2" + G1/4" Alu	900	213000
MDR 5/45	MDR-5 KAA BAAA 300 A400 XXX XXX	-	13 - 45	G 1/2" Alu	820	256182
MDR 5/45-K	MDR-5 KAA AAAA 300 A400 XXX XXX	K*	13 - 45	G 1/2" Alu	860	258513

*For these switches, a thermal, 3-pole overload relay has to be ordered separately, the ON/OFF mechanism will only work with an additional relay
Unloader valves and cable glands for retrofitting, see accessories!

Special model IP 65



- Applications: e.g. pump shafts
- 3-phase
- Switching capacity 5.5 kW
- Max. cut-out pressure 16 bar
- Incl. cable glands PG 16/13,5 ZK
- 3-pole (N.C.)
- Acc. to EN 60947
- Degree of protection IP 65
- Flange: Die-cast aluminium, Stainless steel or brass



MDR 5/5 - G 1/2" Stainless steel

Order reference	Type code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 5/5	MDR-5 CAA BAAA 015A030 XNN XXZ	-	1,5 - 5	G 1/2" Alu	783	258469
MDR 5/8	MDR-5 EAA BAAA 070A080 XNN XXZ	-	2 - 8	G 1/2" Alu	783	258476
MDR 5/11	MDR 5 GAA BAAA 090A110 XNN XXZ	-	2 - 11	G 1/2" Alu	783	258483
MDR 5/16	MDR-5 HAA BAAA 130A160 XNN XXZ	-	2,5 - 16	G 1/2" Alu	783	258490
MDR 5/5 NEW	MDR-5 CVA BAAA 150A030 XNN XXZ	-	1,5 - 5	G 1/2" SS	775	275152
MDR 5/8 NEW	MDR-5 EVA BAAA 070A080 XNN XXZ	-	2 - 8	G 1/2" SS	775	257169
MDR 5/5 NEW	MDR-5 CRA BAAA 015A030 XNN XXZ	-	1,5 - 5	G 1/2" brass	775	275176
MDR 5/8 NEW	MDR-5 ERA BAAA 070A080 XNN XXZ	-	2 - 8	G 1/2" brass	775	275183

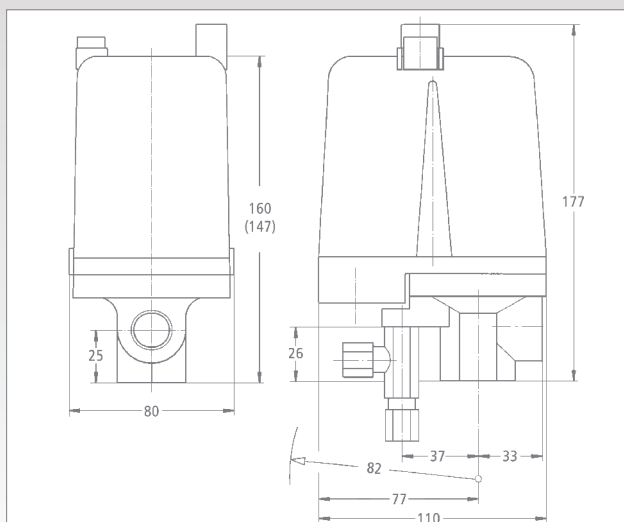
Pressure switch MDR 5

Technical Data MDR 5 acc. to EN 60947	
Rated insulation voltage U_i	500 V
Motor switching capacity (AC 3) $U_e=240$ V (1~)	2,5 kW
Motor switching capacity (AC 3) $U_e=230$ V (3~)	4,0 kW
Motor switching capacity (AC 3) $U_e=400$ V (3~)	5,5 kW
Motor switching capacity (AC 3) $U_e=500$ V (3~)	4,0 kW
Electrical life (AC 3) Cycles	$> 1 \times 10^5$
Mechanical life Cycles	$> 5 \times 10^5$
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	600
Rated operational current I_e at 400 V AC 3 / 500 V AC 3	16 A / 12 A

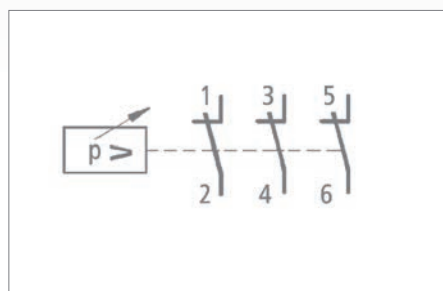
Technical Data MDR 5 acc. to EN 60947		
Bursting strength P_z	up to 16 bar up to 45 bar	> 40 bar > 60 bar
Permissible medium temperature Air		$-5 \dots +80$ °C
Permissible medium temperature Water		$+80$ °C
Degree of Protection acc. to EN 60529		IP 54 / IP 65
Conductor cross-section 1 ... fine stranded cable 1 x / 2 x		2,5 / 2,5 mm ²
Conductor cross-section 1 ... rigid cable 1 x / 2 x		4 / 4 mm ²

Diaphragm media resistance MDR 5	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

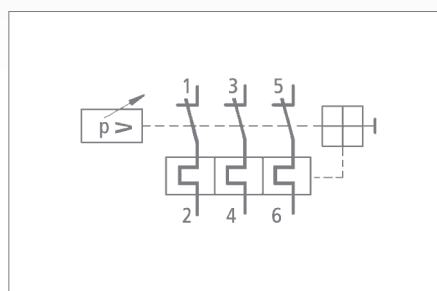
Dimensions MDR 5



Pressure switch MDR-5 G1/2" + Gauge connection G1/4"



MDR 5



MDR 5K - R5

Accessories MDR 5

Order reference	Description	Weight (in g)	Part No.
Unloader valves			
EV 5 ¹⁾	With screw connection for 6 mm plastic or copper discharge tubes, screw connection for vent port	30	201878
EV 5i ¹⁾	With screw connection for 1/4" plastic or copper discharge tubes	30	201885
EV 5E ¹⁾	With screw connection for 6 mm plastic or copper discharge tubes	25	201892
EV 5Ei ¹⁾	With screw connection for 1/4" plastic or copper discharge tubes	25	201908
EV 5H	High pressure relief valve from 16 bar with screw connection for 6 mm copper relief line	30	201915
Delayed unloader valves			
AEV 5	With screw connection for 6 mm plastic or copper discharge tubes	25	201939
AEV 5i	With screw connection for 1/4" plastic or copper discharge tubes	25	201946
Cable glands			
WN M20	Grommet	6	269496
VS-M20	Screw plug M20		269502
M20 Z	With strain relief, clamping range 6-12 mm	12	269533
M20 ZK	With strain relief and cable support, clamping range 6-12 mm	12	269540
M20 L	With strain relief, clamping range 10-14 mm	12	269519
M20 LK	With strain relief and cable support, clamping range 10-14 mm	12	269526
MW 5	Mounting bracket	120	230045
Cover			
H5 (Cover MDR 5)	Cover without push-buttons	130	230052
H5-K (Cover MDR 5+K)	Cover with On/Off push-buttons (Only functions together with the thermal R5 overload relay)	150	217527
Thermal, 3-pole overload relay			
R 5/1,5	0,86 - 1,50 A	150	202028
R 5/2,45	1,50 - 2,45 A	150	202035
R 5/4,2	2,40 - 4,20 A	150	202042
R 5/7,0	4,00 - 7,00 A	150	202059
R 5/10,3	6,10 - 10,3 A	150	202066
R 5/14,0	9,00 - 14,0 A	150	202073
R 5/18,0	11,0 - 18,0 A	150	202080

¹⁾ bis ≤ 16 bar

Unloader valves / Delayed unloader valves



EV 5, EV 5i, EV 5H



EV 5E / EV 5Ei



AEV 5 / AEV 5i

Cable glands MDR 5



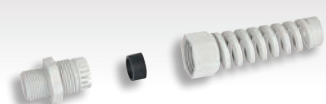
WN-M 20



VS - M 20



M 20 Z / M 20 L



M 20 ZK / M 20 LK

Accessories, Miscellaneous MDR 5



MW 5



H5



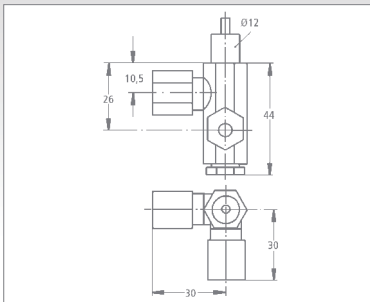
H5-K



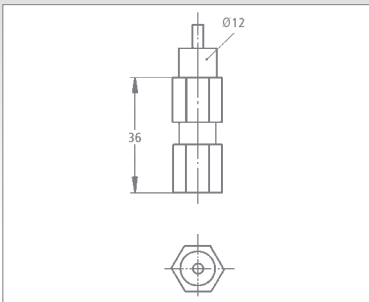
R 5/ ..

High performance
Pressure switches

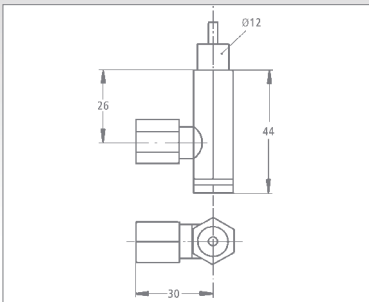
Dimensions, Accessories



EV 5 / EV 5i / EV 5H

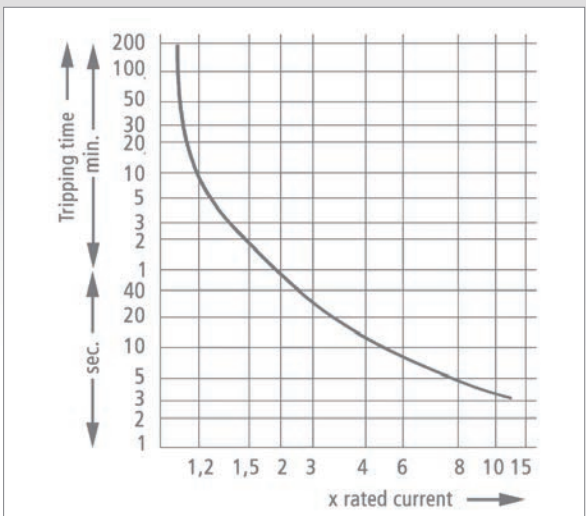


EV 5E / EV 5Ei

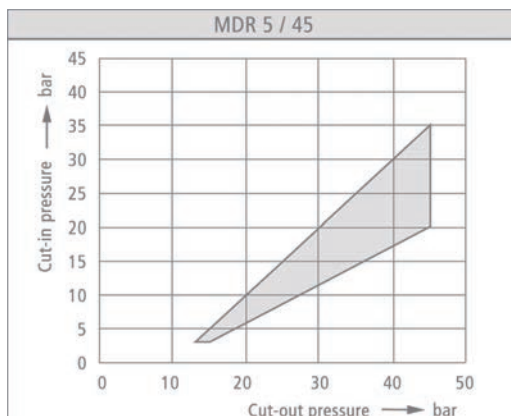
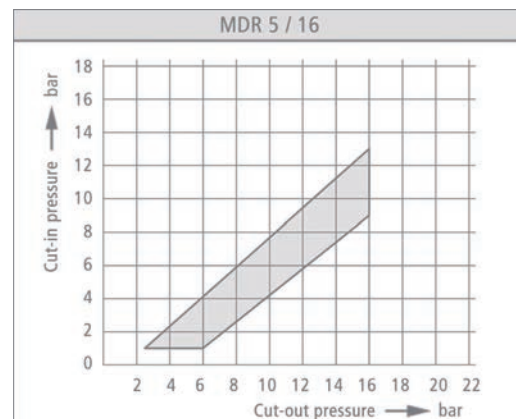
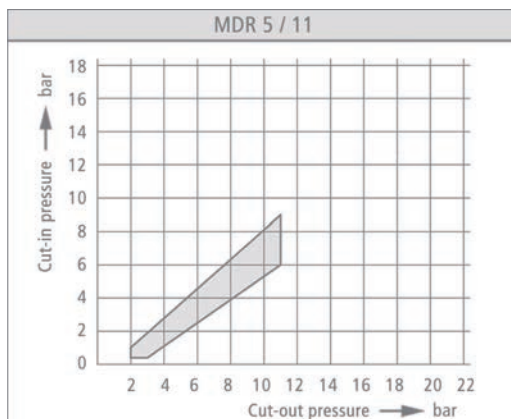
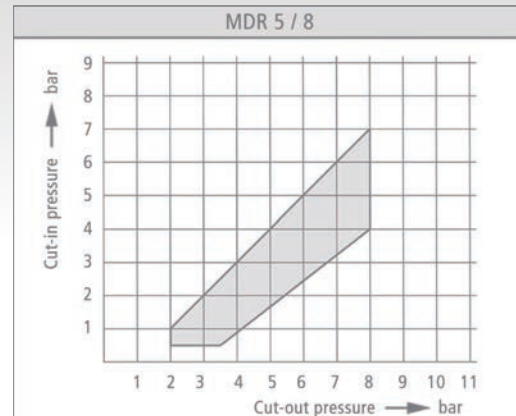
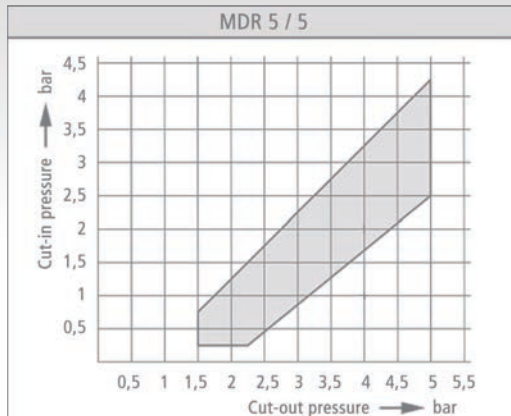


AEV 5 / AEV 5i

Tripping curves R5 (average)



Pressure Diagrams MDR 5







MDR-F...H-S



MDR-P



MDR-K



MDR 43



MDR 53

Control pressure switches

Industries



MDR-F

1 SPDT / 2 DPDT
Normally Closed / Normally Open (NO/NC)
Pressure range up to 250 bar
ATEX / GL / VdS / UL approvals -optional
Scale for simple adjustments
Wide range of variations
Acc. to EN 60947

P. 57

Air pressure technology, water pressure technology, construction machinery, water-based extinguishing systems, fire protection units, oil pressure monitoring, mining, chemical, industry, railway vehicles, offshore, shipping, vacuum technology, calibration technology, heating systems

MDR-P

1 SPDT
Pressure range up to 16 bar
Compact pressure switch with coupling DIN EN 175301
Fixed pressure setting, **OEM applications**

P. 72

Air pressure technology, water pressure technology, construction machinery, breweries, heating systems, calibration technology

MDR-K

2 DPDT
Pressure range up to 11 bar
Bayonet coupling ISO 15170-1
OEM applications

P. 75

Air pressure technology, water pressure technology

MDR 43

1 N.O. + 1 N.C.
Pressure range up to 16 bar

P. 78

Air pressure technology, water pressure technology

MDR 53

1 SPDT
Maximum shut-off pressure setting 16 bar
CSA approval optional
Pressure adjustment without tools

P. 80

Air pressure technology, water pressure technology

Control pressure switch MDR - F



- 1 SPDT / 2 DPDT - Normally Open / Normally Closed (NO/NC)
- Pressure range up to 250 bar
- ATEX / GL / VdS / UL approvals -optional
- Scale for simple adjustments
- Wide range of variations
- Acc. to EN 60947

Applications:

Air pressure technology, water pressure technology, construction machinery, water-based extinguishing systems, fire protection units, oil pressure monitoring, mining, chemical, industry, railway vehicles, offshore, shipping, vacuum technology, calibration technology, heating systems

Specific applied approval



MDR – F ..H-S

Application

The Condor pressure switch series MDR-F can be **universally used** and are suitable for:

- Monitoring and controlling the pressure of liquids or gaseous media in pipelines, tanks, vats, pressure vessels and installations.
- Tasks in process control, cooling, pneumatics and hydraulics.
- Pressure monitoring of cooling circuits and lubrication systems on various types of machinery.
- Automatic switching of pump and compressor motors for supplying water to dwellings, booster pumps, fire-fighting equipment and on compressed air systems.

Mode of operation:

The pressure of the monitored medium operates against a diaphragm, bellows or a plunger all of which have different media resistance. Switching operation is carried out with the use of a micro switch ensuring flutter-free switching

When the pressure reaches the upper switching point, the micro switch contacts change position. In normal cases e.g. a connected motor is switched off (up to 550 watts direct or using additional switches like a contactor etc.). Should the pressure fall below the lower switch point, then the micro switch contact returns to its default position and the motor is switched on.

The upper and lower switching points can be set independently using a screw driver. Both switching points can be read off the scale.

Pressure connection, pressure sensing element and electrical connections are all fitted on to a die-cast aluminum base. The sealable transparent, polycarbonate cover protects the scales and switch against environmental effects.

Standard scope of delivery:

- rubber grommets
- MDR-F..H Die-cast aluminum flange
- MDR-F..Y Plastic flange (in particular for use in water technology applications)
- With industrial screw connection (Industrial clamp version available upon request)

Besides the standard types with Perbunan diaphragms, the following new types are available:

- Pressure switch with stainless steel pressure sensing element e.g. for liquid fuels, oils up to 200°C etc.
- High pressure switch with plastic plunger press. sensing element with stainless steel connection up to 250 bar
- Pressure switch with manual reset function and die-cast aluminum flange for oil, water and air etc.
- Pressure switch with Viton diaphragm and die-cast aluminum flange for increased media resistance
- Pressure switch with VdS approval for fire-extinguishing systems / fire protection-installations
- Pressure switch with GL approval for ship building and applications intended for use at sea
- Pressure switch with ATEX approval in mining and chemicals plants that are at risk of explosion
- Pressure switch with UL approval for the North American market
- Vacuum
- DPDT

The MDR-F pressure switch program is extended continuously. A current status of the existing designs and approvals is available on our homepage.

Control pressure switch MDR - F

MDR-F standard version with die-cast aluminium flange



MDR-F standard version with die-cast aluminium flange and Perbunan diaphragm - for oil, water and air etc. . Pressure switch with industrial cage clamp version.
Connection: H G 3/8" inner thread **
- suffix "G" for gold-flashed contacts

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2H-S	MDR-F 2 HAA SAA A 005A015	0,04 ... 1,89	0,07 0,11	0,11 ... 2	460	253501
MDR-F 2HG-S	MDR-F 2 HAA SBA A 005A015	0,04 ... 1,89	0,07 0,11	0,11 ... 2	460	253518
MDR-F 4H-S	MDR-F 4 HAA SAA A 010A030	0,07 ... 3,75	0,15 0,25	0,22 ... 4	460	253525
MDR-F 4HG-S	MDR-F 4 HAA SBA A 010A030	0,07 ... 3,75	0,15 0,25	0,22 ... 4	460	253532
MDR-F 8H-S	MDR-F 8 HAA SAA A 020A060	0,2 ... 7,5	0,3 0,5	0,5 ... 8	460	253549
MDR-F 8HG-S	MDR-F 8 HAA SBA A 020A060	0,2 ... 7,5	0,3 0,5	0,5 ... 8	460	253556
MDR-F 10H-S	MDR-F 10 HAA SAA A 040A050	0,3 ... 9,2	0,4 0,8	0,7 ... 10	460	253563
MDR-F 10HG-S	MDR-F 10 HAA SBA A 040A050	0,3 ... 9,2	0,4 0,8	0,7 ... 10	460	253570
MDR-F 16H-S	MDR-F 16 HAA SAA A 040A120	0,4 ... 15	0,6 1,0	1 ... 16	460	253587
MDR-F 16HG-S	MDR-F 16 HAA SBA A 040A120	0,4 ... 15	0,6 1,0	1 ... 16	460	253594
MDR-F 32H-S	MDR-F 32 HAA SAA A 100A200	0,8 ... 30	1,2 2,0	2 ... 32	460	253600
MDR-F 32HG-S	MDR-F 32 HAA SBA A 100A200	0,8 ... 30	1,2 2,0	2 ... 32	460	253617

* lower ... upper end of range

** G 1/4" + G 1/2" innerthread - on demand

MDR-F standard version with plastic flange



MDR-F standard version with plastic flange and Perbunan diaphragm - e.g. for demineralized water. Pressure switch with industrial cage clamp version.
Pressure connection: Y G 3/8" inner thread ** - suffix "G" for gold-flashed contacts

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2Y-S	MDR-F 2 YAA SAA A 005A015	0,04 ... 1,89	0,07 0,11	0,11 ... 2	410	253624
MDR-F 2YG-S	MDR-F 2 YAA SBA A 005A015	0,04 ... 1,89	0,07 0,11	0,11 ... 2	410	253631
MDR-F 4Y-S	MDR-F 4 YAA SAA A 010A030	0,07 ... 3,75	0,15 0,25	0,22 ... 4	410	253648
MDR-F 4YG-S	MDR-F 4 YAA SBA A 010A030	0,07 ... 3,75	0,15 0,25	0,22 ... 4	410	253655
MDR-F 8Y-S	MDR-F 8 YAA SAA A 020A060	0,2 ... 7,5	0,3 0,5	0,5 ... 8	410	253662
MDR-F 8YG-S	MDR-F 8 YAA SBA A 020A060	0,2 ... 7,5	0,3 0,5	0,5 ... 8	410	253679
MDR-F 10Y-S	MDR-F 10 YAA SAA A 040A050	0,3 ... 9,2	0,4 0,8	0,7 ... 10	410	253686
MDR-F 10YG-S	MDR-F 10 YAA SBA A 040A050	0,3 ... 9,2	0,4 0,8	0,7 ... 10	410	253693
MDR-F 16Y-S	MDR-F 16 YAA SAA A 040A120	0,4 ... 15	0,6 1,0	1 ... 16	410	253709
MDR-F 16YG-S	MDR-F 16 YAA SBA A 040A120	0,4 ... 15	0,6 1,0	1 ... 16	410	253716

* lower ... upper end of range

** G 1/4" + G 1/2" innerthread - on demand

Control pressure switch MDR - F

MDR-F features Pressure connection and pressure transducer element stainless steel



MDR-F features Pressure connection and pressure transducer element
Stainless steel for liquid fuels, oils up to 200 ° C, etc..
Pressure switch equipped with industry-screw
Pressure connection: G 1/4 "female thread - suffix " G
"for gold-plated contacts."

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 12HE-S	MDR-F 12 HEC SAA A 060A070	0,5 ... 11,2	0,5 0,8	1 ... 12	520	253723
MDR-F 12HEG-S	MDR-F 12 HEC SBA A 060A070	0,5 ... 11,2	0,5 0,8	1 ... 12	520	253730
MDR-F 30HE-S	MDR-F 30 HEC SAA A 160A200	1 ... 26,4	3,0 3,6	4 ... 30	520	253747
MDR-F 30HEG-S	MDR-F 30 HEC SBA A 160A200	1 ... 26,4	3,0 3,6	4 ... 30	520	253754

* lower ...upper end of range

MDR-F high-pressure switch version (up to 250 bar)



MDR-F high-pressure switch version (up to 250 bar)
with plastic plunger press. sensing element with stainless steel
connection and Industrial cage clamp version for oil, water and air
etc. .
Pressure connection: HH G 3/8" inner thread - suffix "G"
for gold-flashed contacts

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No
MDR-F 60HH-S	MDR-F 60 HHA SAA A 200A400	4 ... 52	4 8	8 ... 60	570	253761
MDR-F 60HHG-S	MDR-F 60 HHA SBA A 200A400	4 ... 52	4 8	8 ... 60	570	253778
MDR-F 120HH-S	MDR-F 120 HHA SAA A 200A800	8 ... 104	8 16	16 ... 120	570	253785
MDR-F 120HHG-S	MDR-F 120 HHA SBA A 200A800	8 ... 104	8 16	16 ... 120	570	253792
MDR-F 250HH-S	MDR-F 250 HHA SAA A 100B200	14 ... 226	12 24	26 ... 250	570	253808
MDR-F 250HHG-S	MDR-F 250 HHA SBA A 100B200	14 ... 226	12 24	26 ... 250	570	253815

* lower ...upper end of range

MDR-F version with reset function (Hmin / Hmax and Htro) with die-cast aluminium flange



MDR-F version with reset function (Hmin / Hmax and Htro)
with die-cast aluminium flange
and Perbunan diaphragm - for oil, water and air etc.
Pressure switch with industrial cage clamp version.
Pressure connection: H G 3/8" inner thread

MDR-F .. Hmax (SPDT with manual reset max.)

When pressure rises above the upper setting value, contact 11-12 opens and contact 11-14 closes and latches. When the pressure falls below the upper setting value, the contact can be released with the manual reset button.

MDR-F .. Hmin (SPDT with manual reset min.)

After pressure rises above the lower setting value, the function is activated by pressing the manual reset button. When the pressure falls, contact 11-12 closes and opens contact 11-14 when reaching the lower cut-in value. Since the upper switching point (cut-out pressure) of the reset pressure switch must lie above the maximum cut-out pressure of the apparatus, the switching state remains until the manual reset button is pressed again.

MDR-F .. Htro (SPDT with manual reset as run-dry protection)

Typically, the switch is connected in series with the control circuit. For pressure increase, the manual reset button must be held until the pressure lies beyond the monitoring point. When the pressure falls below the monitoring point, contact 11-12 closes and contact 11-14 opens. When the pressure automatically rises above 10% of the monitored pressure, contact 11-12 opens and contact 11-14 closes again automatically, otherwise, a restart using the manual reset button must be carried out again. NOTICE: Should there not be a rise in pressure when pressing the button, discontinue pressing the button as a fault in the system must be present.

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2Hmax-S	MDR-F 2 HAA SAH A XXXA015	-	-	0,11 ... 2	430	254065
MDR-F 4Hmax-S	MDR-F 4 HAA SAH A XXXA030	-	-	0,22 ... 4	430	254072
MDR-F 8Hmax-S	MDR-F 8 HAA SAH A XXXA060	-	-	0,5 ... 8	430	254089
MDR-F 10Hmax-S	MDR-F 10 HAA SAH A XXXA075	-	-	0,7 ... 10	430	254096
MDR-F 16Hmax-S	MDR-F 16 HAA SAH A XXXA120	-	-	1 ... 16	430	254102
MDR-F 32Hmax-S	MDR-F 32 HAA SAH A XXXA240	-	-	2 ... 32	430	254119
MDR-F 2Hmin-S *1	MDR-F 2 HAA SAL A 005A015	0,04 ... 1,89	0,07 0,11	0,11 ... 2	430	254126
MDR-F 4Hmin-S *1	MDR-F 4 HAA SAL A 010A030	0,07 ... 3,75	0,15 0,25	0,22 ... 4	430	254133
MDR-F 8Hmin-S *1	MDR-F 8 HAA SAL A 020A060	0,2 ... 7,5	0,3 0,5	0,5 ... 8	430	254140
MDR-F 10Hmin-S *1	MDR-F 10 HAA SAL A 025A075	0,3 ... 9,2	0,4 0,8	0,7 ... 10	430	254157
MDR-F 16Hmin-S *1	MDR-F 16 HAA SAL A 040A120	0,4 ... 15	0,6 1,0	1 ... 16	430	254164
MDR-F 32Hmin-S *1	MDR-F 32 HAA SAL A 080A240	0,8 ... 30	1,2 2,0	2 ... 32	430	254171
MDR-F 2Htro-S	MDR-F 2 HAA SAG A 005AXXX	0,04 ... 1,89	-	-	430	254188
MDR-F 4Htro-S	MDR-F 4 HAA SAG A 010AXXX	0,07 ... 3,75	-	-	430	254195
MDR-F 8Htro-S	MDR-F 8 HAA SAG A 020AXXX	0,2 ... 7,5	-	-	430	254201
MDR-F 10Htro-S	MDR-F 10 HAA SAG A 025AXXX	0,3 ... 9,2	-	-	430	254218
MDR-F 16Htro-S	MDR-F 16 HAA SAG A 040AXXX	0,4 ... 15	-	-	430	254225
MDR-F 32Htro-S	MDR-F 32 HAA SAG A 080AXXX	0,8 ... 30	-	-	430	254232

* lower ... upper end of range

*1 The minimum-pressure to be overseen and the operating-pressure must be in the pressure-spectrum of the cut-in-pressure.

Additional MDR-F pressure switch versions .. Reset function are available on request
(e.g. as stainless steel bellows version, with gold-flashed contacts, as high pressure switch etc.).



MDR-F version with die-cast aluminium flange and Viton diaphragm

for **enhanced media resistance**. Pressure switch with industrial cage clamp version.
Pressure connection: H G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2HV-S	MDR-F 2 HVA SAA A 005A015	0,04 ... 1,89	0,07 0,11	0,11 ... 2	410	253884
MDR-F 4HV-S	MDR-F 4 HVA SAA A 010A030	0,07 ... 3,75	0,15 0,25	0,22 ... 4	410	253891
MDR-F 8HV-S	MDR-F 8 HVA SAA A 020A060	0,2 ... 7,5	0,3 0,5	0,5 ... 8	410	253907
MDR-F10 HV-S	MDR-F 10 HVA SAA A 040A050	0,3 ... 9,2	0,4 0,8	0,7 ... 10	410	253914
MDR-F 16HV-S	MDR-F 16 HVA SAA A 040A120	0,4 ... 15	0,6 1,0	1 ... 16	410	253921
MDR-F 32HV-S	MDR-F 16 HVA SAA A 100A200	0,8 ... 30	1,2 2,0	2 ... 32	410	253938

* lower ...upper end of range

Additional MDR-F pressure switch versions MDR-F.HV are available on request (e. g. with reset function, with gold-flashed contacts, with plastic flange etc.)

VdS pressure switches for water extinguishing systems / fire-fighting equipments



These pressure switches are primarily conceived for the use in firmly installed water extinguishing systems / fire-fighting equipments and approved from the VdS damage-prevention under the NO. G 4090008.

In particular, selective examinations, the request-profiles, the quality and the functionality intensively are tested.

Dependent on the use there are:

- Alarm pressure switches (MDR-F 2...VdS...), which are manufactured with a pressure range from 0,35 to 1 bar with minimal difference, and
- Pressure switches (MDR-F X...VdS...), with 10, 12.5 or 16 bar set for X, which limit the maximum pressure



VdS pressure switches for water extinguishing systems / fire-fighting equipments

difference between cut-in and cut-out pressure to 1,5 bar.

As MDR-F...VdS with reset function, standard only the alarm pressure switch is as max.-Reset listed. However, it is all VdS pressure switch with each reset function (see overview MDR-F with reset function), alternatively a Viton diaphragm and / or also a flange with 3/8" inner-screw threads on inquiry available.

Moreover, customer-specific boards with own circuits and LED in integrated design are available as well as realisable. Further information can be seen on our homepage: www.condor-cpc.com.

Please take into account that the use of the pressure switch with plastic flange is restricted up to 10 bar.

MDR-F VdS version for water-based extinguishing systems / fire protection with die-cast aluminium flange

and Perbunan diaphragm for water extinguishing systems. Pressure switch with industrial cage clamp version.
Pressure connection: H G 1/2" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2H-S VdS	MDR-F 2 HAB SAA A XXXA007 A		0,1	0,35 ... 1	460	259060
MDR-F 2Hmax-S VdS	MDR-F 2 HAB SAH A XXXA007 A		0,1	0,35 ... 1	460	259077
MDR-F 10H-S VdS	MDR-F 10 HAB SAA A 040A050 A	0,3 ... 8,5	0,4 1,5	0,7 ... 10	460	259084
MDR-F 12H-S VdS	MDR-F 12 HAB SAA A 080A090 A	0,4 ... 11	0,6 1,5	1 ... 12,5	460	259091
MDR-F 16H-S VdS	MDR-F 16 HAB SAA A 110A120 A	0,4 ... 14,5	0,6 1,5	1 ... 16	460	259107

MDR-F VdS overview for water-based extinguishing systems / fire protection MDR-F .. Y...with plastic flange

and Perbunan diaphragm for water extinguishing systems / fire-fighting equipments. Pressure switch with industrial cage clamp version.
Pressure connection: H G 1/2" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2Y-S VdS	MDR-F 2 YAB SAA A XXXA007 A		0,1	0,35 ... 1	410	259145
MDR-F 2Ymax-S VdS	MDR-F 2 YAB SAH A XXXA007 A		0,1	0,35 ... 1	410	259152
MDR-F 10Y-S VdS	MDR-F 10 YAB SAA A 040A050 A	0,3 ... 8,5	0,4 1,5	0,7 ... 10	410	259169

GL Pressure Switch for Ship Building and Applications Intended for Use at Sea



These pressure switches are mostly used in the field of shipping technology, particularly in ship and plant engineering, and are approved by GL (Germanischer Lloyd); one of the largest classification societies in the field of shipping, under No. 86884-10 HH.

The requirement profiles, quality and functionality have been intensively tested by means of specialized, demanding tests.

Our GL pressure switches can be used up to a maximum of 250 bar. Pressure switches fitted with plastic flanges are approved up to 12.5 bar.

All GL pressure switches can also be fitted with a reset button.

Because of the variety of possible pressure switch configurations, please feel free to simply contact us if you have queries regarding special applications or technical requests.



Condor Pressure Switch for ship Building and Applications Intended for Use at Sea are approved by GL (Germanischer Lloyd).

MDR-F GL version GL - MDR-F.H..GLf - with die-cast aluminium flange

and Perbunan diaphragm, GL cable gland, **for shipbuilding and seaworthy applications**. Pressure switch with industrial cage clamp version.
Pressure connection: G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2H-S GL	MDR-F 2 HAA SAA H 005A015 G	0,04 ... 1,89	0,07 0,11	0,11 ... 2	540	261766
MDR-F 4H-S GL	MDR-F 4 HAA SAA H 010A030 G	0,07 ... 3,75	0,15 0,25	0,22 ... 4	540	261773
MDR-F 8H-S GL	MDR-F 8 HAA SAA H 020A060 G	0,2 ... 7,5	0,3 0,5	0,5 ... 8	540	261780
MDR-F 10H-S GL	MDR-F 10 HAA SAA H 040A050 G	0,3 ... 9,2	0,4 0,8	0,7 ... 10	540	261797
MDR-F 12H-S GL	MDR-F 12 HAA SAA H 080A090 G	0,4 ... 11	0,6 1,5	1 ... 12,5	540	261896
MDR-F 16H-S GL	MDR-F 16 HAA SAA H 040A120 G	0,4 ... 15	0,6 1,0	1 ... 16	540	261803
MDR-F 32H-S GL	MDR-F 32 HAA SAA H 100A200 G	0,8 ... 30	1,2 2,0	2 ... 32	540	261810

* lower ... upper end of range

MDR-F overview GL - MDR-F .. HH..GL - High pressure switch (up to 250 bar) with plastic plunger

sensing element with stainless steel connection, GL Cable gland, **for shipbuilding and seaworthy applications**. Pressure switch with industrial cage clamp version. Pressure Connection: HH G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 60HH-S GL	MDR-F 60 HHA SAA H 200A400 G	4 ... 52 bar	4 8	8 ... 60 bar	570	261858
MDR-F 120HH-S GL	MDR-F 120 HHA SAA H 200A800 G	8 ... 104 bar	8 16	16 ... 120 bar	570	261865
MDR-F 250HH-S GL	MDR-F 250 HHA SAA H 100B200 G	14 ... 226 bar	12 24	26 ... 250 bar	570	261872

* lower ... upper end of range



You need more information? -
Request our special catalog - "GL" -products!



Control pressure switch MDR - F

MDR-F ATEX version in explosion-risk units for mining and chemical industries



The pressure switch MDR-F serves as a on and off switch for intrinsically safe circuits dependant upon the pressure of various media.

This switch can be used in firedamp-susceptible mines, explosive gas atmospheres and explosive dust atmospheres. (Groups I, II, III)

Because we, as a recognized ATEX production plant, are able to manufacture pressure switches with a wide variety of configurations, please feel free to simply contact us if you have queries regarding special applications or technical requests.

Application: Mining (firedamp, coal dust) Ex I M2 Ex ia I Mb

MDR-F overview ATEX - MDR-F .. JG...Ex - with zinc die-cast flange

and NBR diaphragm. Pressure switch with industrial cage clamp version and plastic cover.
Pressure connection: G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2JG-S Ex I M2	MDR-F 2 JAA SBA J 005A015 B2XX ---1pce.a	0,04...1,89	0,07 0,11	0,11...2	610	262204
MDR-F 4JG-S Ex I M2	MDR-F 4 JAA SBA J 010A030 B2XX ---1pce.a	0,07...3,75	0,15 0,25	0,22...4	610	262213
MDR-F 8JG-S Ex I M2	MDR-F 8 JAA SBA J 020A060 B2XX ---1pce.a	0,2...7,5	0,3 0,5	0,5...8	610	262220
MDR-F 10JG-S Ex I M2	MDR-F 10 JAA SBA J 040A050 B2XX ---1pce.a	0,3...9,2	0,4 0,8	0,7...10	610	262237
MDR-F 16JG-S Ex I M2	MDR-F 16 JAA SBA J 040A120 B2XX ---1pce.a	0,4...15	0,6 1	1...16	610	262251
MDR-F 32JG-S Ex I M2	MDR-F 32 JAA SBA J 100A200 B2XX ---1pce.a	0,8...30	1,2 2	2...32	610	262268

MDR-F overview ATEX - MDR-F .. JHG...Ex - High pressure switch (up to 250 bar) with plastic plunger

and stainless steel and zinc die-cast flange. Pressure switch with industrial cage clamp version and plastic cover.
Pressure connection: G 3/8" inner thread with choke

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 60JHG-S Ex I M2	MDR-F 60 JHA SBA J 200A400 B2XX ---1pce.a	4...52	4 8	8...60	620	262275
MDR-F 120JHG-S Ex I M2	MDR-F 120 JHA SBA J 200A800 B2XX ---1pce.a	8...104	8 16	16...120	620	262282
MDR-F 250JHG-S Ex I M2	MDR-F 250 JHA SBA J 100B200 B2XX ---1pce.a	14...226	12 24	26...250	620	262299

MDR-F overview ATEX - MDR-F .. JEG...Ex - with zinc die-cast flange

Pressure switch with stainless steel pressure transducer with stainless steel and zinc die-cast flange. Pressure switch with industrial cage clamp version and plastic cover. Pressure connection: G 1/4" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 12JEG-S Ex I M2	MDR-F 12 JEC SBA J 060A070 B2XX ---1pce.a	0,5...11,2	0,5 0,8	1...12	670	262503
MDR-F 30JEG-S Ex I M2	MDR-F 30 JEC SBA J 160A200 B2XX ---1pce.a	1...26,4	3,0 3,6	4...30	670	262510

MDR-F overview ATEX - MDR-F .. JG...Ex - for Vacuum monitoring with zinc die-cast flange

and Perbunan diaphragm. Pressure switch with industrial cage clamp version and plastic cover.
Pressure connection: H G 1/4" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 03JG-S Ex I M2	MDR-F 03 JAC SBA J 010V030 B2XX ---1pce.a	-0,9...0,15	0,15	-0,75...0,3	658	262558
MDR-F 3JG-S Ex I M2	MDR-F 3 JAC SBA J 100V150 B2XX ---1pce.a	-0,9...2,6	0,2 0,4	-0,7...3	672	262565

Control pressure switch MDR - F

Application: Industry (gases, fumes) Ex II 2G Ex ia IIC T6 Gb and industry (dust) Ex II 2D Ex ia IIIC T85°C Db

MDR-F overview ATEX - MDR-F .. HG...Ex - with die-cast flange

and NBR diaphragm. Pressure switch with industrial cage clamp version and aluminium die-cast cover.
Pressure connection: G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2HG-S Ex II 2 GD	MDR-F 2 HAA SBA J 005A015 C2XX ---1pce.a	0,04...1,89	0,07 0,11	0,11...2	565	262404
MDR-F 4HG-S Ex II 2 GD	MDR-F 4 HAA SBA J 010A030 C2XX ---1pce.a	0,07...3,75	0,15 0,25	0,22...4	565	262541
MDR-F 8HG-S Ex II 2 GD	MDR-F 8 HAA SBA J 020A060 C2XX ---1pce.a	0,2...7,5	0,3 0,5	0,5...8	565	262428
MDR-F 10HG-S Ex II 2 GD	MDR-F 10 HAA SBA J 040A050 C2XX ---1pce.a	0,3...9,2	0,4 0,8	0,7...10	565	262435
MDR-F 16HG-S Ex II 2 GD	MDR-F 16 HAA SBA J 040A120 C2XX ---1pce.a	0,4...15	0,6 1	1...16	565	262459
MDR-F 32HG-S Ex II 2 GD	MDR-F 32 HAA SBA J 100A200 C2XX ---1pce.a	0,8...30	1,2 2	2...32	565	262466

MDR-F overview ATEX - MDR-F .. HHG...Ex - High pressure switch (up to 250 bar) with plastic plunger

and with stainless steel and aluminium die-cast flange. Pressure switch with industrial cage clamp version and aluminium die-cast cover.
Pressure connection: G 3/8" inner thread with choke

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 60HHG-S Ex II 2 GD	MDR-F 60 HHA SBA J 200A400 C2XX ---1pce.a	4...52	4 8	8...60	675	262473
MDR-F 120HHG-S Ex II 2 GD	MDR-F 120 HHA SBA J 200A800 C2XX ---1pce.a	8...104	8 16	16...120	675	262480
MDR-F 250HHG-S Ex II 2 GD	MDR-F 250 HHA SBA J 100B200 C2XX ---1pce.a	14...226	12 24	26...250	675	262497

MDR-F overview ATEX - MDR-F .. HEG - Pressure switch with stainless steel pressure transducer

and with stainless steel and aluminium die-cast flange. Pressure switch with industrial cage clamp version and aluminium die-cast cover.
Pressure connection: G 1/4" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 12HEG-S Ex II 2 GD	MDR-F 12 HEC SBA J 060A070 C2XX ---1pce.a	0,5...11,2	0,5 0,8	1...12	625	262527
MDR-F 30HEG-S Ex II 2 GD	MDR-F 30 HEC SBA J 160A200 C2XX ---1pce.a	1...26,4	3,0 3,6	4...30	625	262534

MDR-F overview ATEX - MDR-F .. HG...Ex - for monitoring vacuum with aluminium die-cast flange

and with NBR diaphragm. Pressure switch with industrial cage clamp version and aluminium die-cast cover.
Pressure connection: G 1/4" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 03HG-S Ex II 2 GD	MDR-F 03 HAC SBA J 010V030 C2XX ---1pce.a	-0,9...0,15	0,15	-0,75...0,3	613	262572
MDR-F 3HG-S Ex II 2 GD	MDR-F 3 HAC SBA J 100V150 C2XX ---1pce.a	-0,9...2,6	0,2 0,4	-0,7...3	627	262589



You need more information? -
Request our special catalog - "ATEX" -products!



Control pressure switch MDR - F

MDR-F UL version for the North American market



Pressure switches are designed for the North American market and were approved by Underwriters Laboratories, Inc. (UL) under the approval number E86689. During special high-demanding examinations, requirements, quality and functionality

were tested intensively. Due to the variety of possible pressure switch versions, please simply contact us for questions about special applications or technical requests.

MDR-F overview UL - MDR-F .. H...UL - Pressure switch with aluminium die-cast flange

and with NBR diaphragm. Pressure switch with industrial cage clamp version.
Pressure connection: G 3/8" inner thread*)

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (psi)	Adjustable cut-out pressure (psi)	Weight (in g)	Part No.
MDR-F 2H-S UL	MDR-F 2 HAA SAA A 008D020 EXXX ---1pce.a	0,6...27	1 2	1,6...29	460	269885
MDR-F 4H-S UL	MDR-F 4 HAA SAA A 015D040 EXXX ---1pce.a	1...54	2 4	3...58	460	269892
MDR-F 8H-S UL	MDR-F 8 HAA SAA A 030D060 EXXX ---1pce.a	3...108	4 8	7...116	460	269908
MDR-F 10H-S UL	MDR-F 10 HAA SAA A 060D075 EXXX ---1pce.a	4...133	6 12	10...145	460	269915
MDR-F 16H-S UL	MDR-F 16 HAA SAA A 080D160 EXXX ---1pce.a	6...217	9 15	15...232	460	269922
MDR-F 32H-S UL	MDR-F 32 HAA SAA A 145D290 EXXX ---1pce.a	12...435	18 29	30...464	460	269939

*) 1/4"NPT on request

MDR-F overview UL - MDR-F .. HH...UL - High pressure switch (up to 3625 psi) with plastic plunger

with stainless steel and aluminium die-cast flange. Pressure switch with industrial cage clamp version.
Pressure connection: G 3/8" inner thread with choke

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (psi)	Adjustable cut-out pressure (psi)	Weight (in g)	Part No.
MDR-F 60HH-S UL	MDR-F 60 HHA SAA A 290D580 EXXX ---1pce.a	58...754	58 116	116...870	570	269946
MDR-F 120HH-S UL	MDR-F 120 HHA SAA A 058E116 EXXX ---1pce.a	116...1508	116 232	232...1740	570	269953
MDR-F 250HH-S UL	MDR-F 250 HHA SAA A 145E290 EXXX ---1pce.a	203...3277	174 348	377...3625	570	269960

MDR-F overview UL - MDR-F .. H...UL - for monitoring vacuum with aluminium die-cast flange

and with NBR diaphragm. Pressure switch with industrial cage clamp version.
Pressure connection: G 1/4" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (psi)	Adjustable cut-out pressure (psi)	Weight (in g)	Part No.
MDR-F 03H-S UL	MDR-F 03 HAC SAA A 010V030 EXXX ---1pce.a	-13 ... 2,2	2,2	-10,9...4,4	508	269977
MDR-F 3H-S UL	MDR-F 3 HAC SAA A 100V150 EXXX ---1pce.a	-13 ... 37,7	2,9 5,8	-10,2...43,5	522	269984

Control pressure switch MDR - F

MDR-F vacuum monitoring version

These pressure switches can be used as vacuum switches for compressible materials (gases), but also for liquids, within the normal pressure range.

Their range of application includes, for example, the fields of automation, transportation, heating, climate-control and ventilation.

They have been designed primarily for use in the rough vacuum range (technical vacuum) and are distinguished by their small pressure differences and high level of switching precision.

They offer universal application potential as openers, closers or changers.

MDR-F overview - MDR-F .. H (G) - for Vacuum monitoring with aluminium die-cast flange

and with Perbunan diaphragm - for oil, water and air etc. . Pressure switch with industrial cage clamp version.
Pressure connection: H G 1/4" inner thread - suffix "G" for gold-flashed contacts

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 03H-S	MDR-F 03 HAC SAA A 010V030 XXXX	-0,9 ... 0,15	0.15	-0.75 ... 0.3	508	264019
MDR-F 03HG-S	MDR-F 03 HAC SBA A 010V030 XXXX	-0,9 ... 0,15	0.15	-0.75 ... 0.3	508	264026
MDR-F 3H-S	MDR-F 3 HAC SAA A 100V150 XXXX	-0,9 ... 2.6	0.2 0.4	-0,7 ... 3	522	264057
MDR-F 3HG-S	MDR-F 3 HAC SBA A 100V150 XXXX	-0,9 ... 2.6	0.2 0.4	-0,7 ... 3	522	264064

MDR-F DPDT version

This pressure switch is characterized by be equipped with a DPDT. As a result, the switch is even more flexible in its range of applications. Due to the variety of possible

pressure switch versions, please simply contact us for questions about special applications or technical requests.

MDR-F overview - MDR-F .. H...LF - with aluminium die-cast flange

and with NBR diaphragm - for oil, water and air etc. . Pressure switch with industrial cage clamp version.
Pressure connection: G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2H-2W-S	MDR-F 2 HAA LFA D 005A015 XXXX ---1pce.a	0.04 ... 1.84	0.08 ... 0.16	0.12 ... 2	460	269717
MDR-F 4H-2W-S	MDR-F 4 HAA LFA D 010A030 XXXX ---1pce.a	0.07 ... 3.65	0.18 0.35	0.25 ... 4	460	269724
MDR-F 8H-2W-S	MDR-F 8 HAA LFA D 020A060 XXXX ---1pce.a	0.2 ... 7.3	0.35 0.7	0.55 ... 8	460	269731
MDR-F 10H-2W-S	MDR-F 10 HAA LFA D 040A050 XXXX ---1pce.a	0.3 ... 8.9	0.45 1.1	0.75 ... 10	460	269748
MDR-F 16H-2W-S	MDR-F 16 HAA LFA D 040A120 XXXX ---1pce.a	0.4 ... 14.6	0.7 1,4	1.1 ... 16	460	269755
MDR-F 32H-2W-S	MDR-F 32 HAA LFA D 100A200 XXXX ---1pce.a	0.8 ... 29.2	1.4 2.8	2.2 ... 32	460	269762

MDR-F Type overview - MDR-F .. H...LF - with plastic flange

and with NBR diaphragm - for example, for purified water. Pressure switch with industrial cage clamp version.
Pressure connection: G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-F 2Y-2W-S	MDR-F 2 YAA LFA D 005A015 XXXX ---1pce.a	0.04 ... 1.84	0.08 0.16	0.12 ... 2	410	269779
MDR-F 4Y-2W-S	MDR-F 4 YAA LFA D 010A030 XXXX ---1pce.a	0.07 ... 3.65	0.18 0.35	0.25 ... 4	410	269786
MDR-F 8Y-2W-S	MDR-F 8 YAA LFA D 020A060 XXXX ---1pce.a	0.2 ... 7.3	0.35 0.7	0.55 ... 8	410	269793
MDR-F 10Y-2W-S	MDR-F 10 YAA LFA D 040A050 XXXX ---1pce.a	0.3 ... 8.9	0.45 1.1	0.75 ... 10	410	269709
MDR-F 16Y-2W-S	MDR-F 16 YAA LFA D 040A120 XXXX ---1pce.a	0.4 ... 14.6	0.7 1,4	1.1 ... 16	410	269716



Control pressure switch MDR - F

Technical data MDR-F standard version	
Rated operational current I_e AC 1 $U_e=240\text{ V (1~)}$	10 A
Rated operational current I_e AC 15 $U_e=240\text{ V (1~)}$	4 A
Rated operational current I_e DC 13 $U_e=240\text{ V (1~)}$	0,1 A
Permissible motor rating 1~ 230 V	0,55 kW
Motor switching capacity (UL 508, CSA 22.2) $U_e=125\text{ VAC}$	0,5 HP
Motor switching capacity (UL 508, CSA 22.2) $U_e=250\text{ VAC}$	0,5 HP
Rated operational current I_e (UL 508, CSA 22.2) $U_e=250\text{ VAC}$	15 A
Rated operational current I_e (UL 508, CSA 22.2) $U_e=12\text{ VDC}$	6 A

Technical data MDR-F.(G) - gold-flashed contact	
Rated operational current I_e $U_e=30\text{ V (1~)}$	400 mA
Permissible motor rating 1~ 30 V	12 VA
Motor switching capacity (UL 508, CSA 22.2) $U_e=125 - 250\text{ VAC}$	0,5 HP
Rated operational current I_e (UL 508, CSA 22.2) $U_e=250\text{ VAC}$	10 A
Rated operational current I_e (UL 508, CSA 22.2) $U_e=12\text{ VDC}$	6 A

Technical data MDR-F	
Vibration resistance 10 bis 1000 Hz	4 g
Degree of protection acc. to DIN 40 050/IEC 529 With rubber grommets	IP 54
Degree of protection acc. to DIN 40 050/IEC 529 With cable glands M20	IP 65
Ambient temperature range	- 20 °C .. + 70 °C
Cross-sections Cage clamp (without cable end sleeve)	1,5 mm ²
Cross-sections Screw clamp	2,5 mm ²

Media resistance MDR-F.
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully

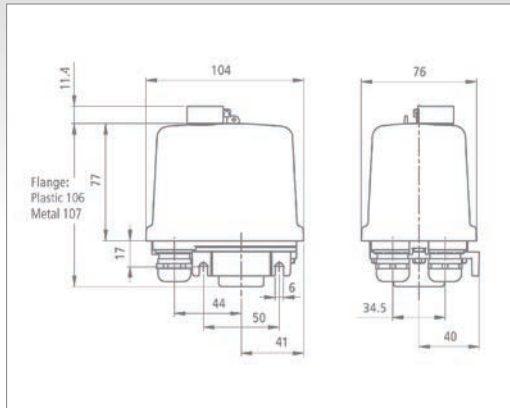
Technical data MDR-F... Ex	
Maximum switching voltage U_i	200 V
Maximum switching strength I_i	3 A
Maximum internal capacity C_i	negligible
Maximum internal conductivity I_i	negligible
Ambient temperature T_a	-30 °C ≤ T_a ≤ +65 °C
Only for connection to a separately examined and certified intrinsically safe circuit in the protection type: Ex ia I Mb (MDR-F... JG... Ex) Ex ia IIC Ex ia IIA, IIB, IIC T6 Gb (MDR-F ... HG...Ex) Ex ia IIIC T85°C Db (MDR-F ... HG...Ex)	

Technical data MDR-F		
Perm. media temperature:	MDR-F..H / HH MDR-F..HV MDR-F..HE MDR-F..Y	+ 70 °C + 130 °C + 200 °C + 50 °C
Repeatability		<2% FS

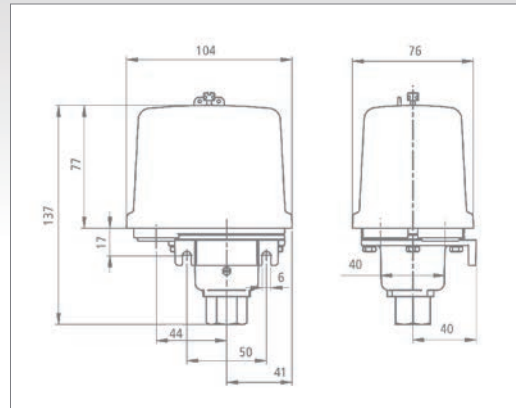
Attention: Please, regard the MDR-F instructions enclosing the pressure switch for the max. operating pressure and the max. inspection pressure.

Control pressure switch MDR - F

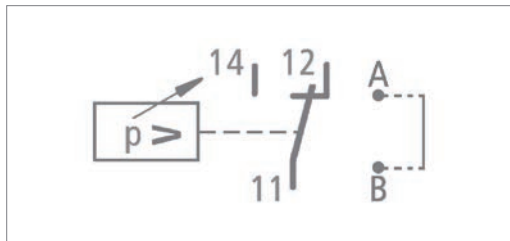
Dimensions MDR - F / Circuit diagram MDR-F



Pressure switch MDR – F..H / ..Y / ..HV



Pressure switch MDR – F..HH / ..HE



For special applications e.g. VdS an individual configuration with an integrated board is available (in the standard version the terminals A and B are connected)

Control pressure switches

Accessories

Order reference	Description	Weight (in g)	Part No.
	Cable glands		
MDR-F M20 M	Cable gland M20 metal	35	254249
MDR-F M20 K	Cable gland M20 plastic	18	259503
	Throttle		
MDR-F D-32	MDR-F up to 32 bar	1	254256
MDR-F D+32	MDR-F as of 32 bar	2	254263
	Covers		
MDR-F Cover	MDR-F Cover, transparent, Standard	90	254270
MDR-F Cover R	MDR-F Cover, transparent, with Reset push-button - for manual reset	115	254287
	Reset push-button		
MDR-F RT-1	Reset push-buttons for mounting on cover R	25	254294

Additional accessories (e.g. pressure connectors) on demand



MDR-F M20 M

MDR-F M20 K

MDR-F D-32

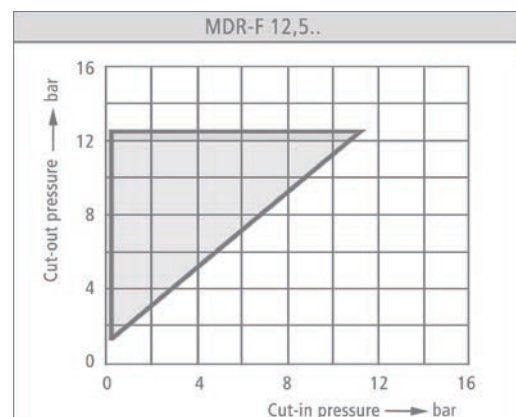
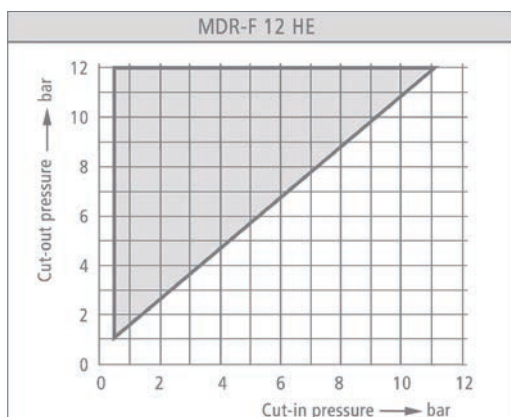
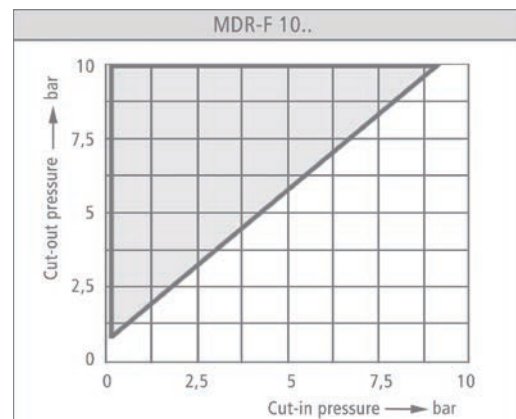
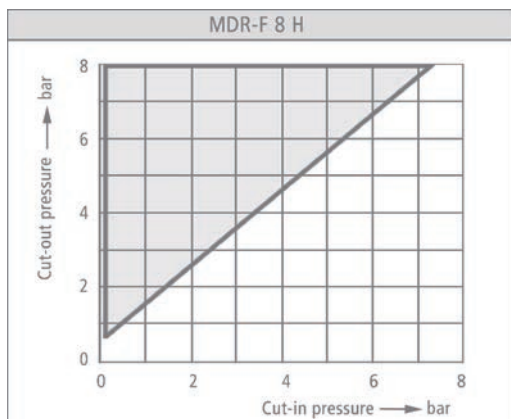
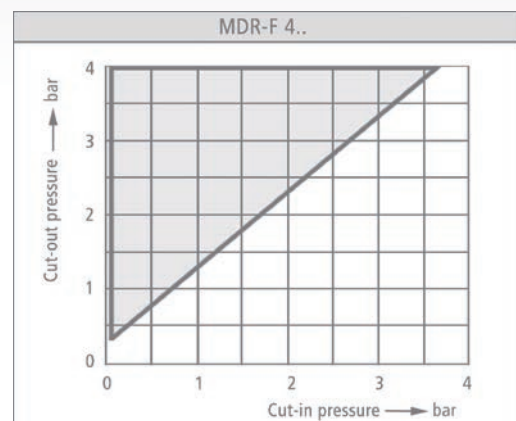
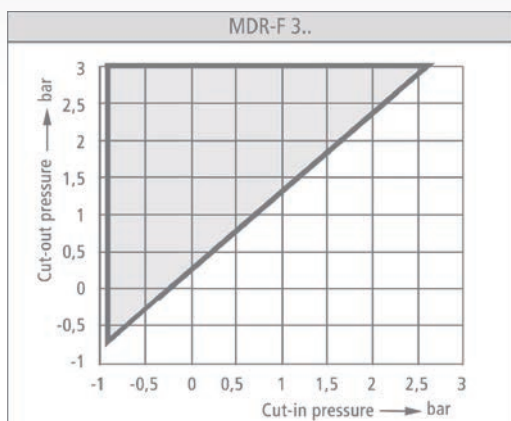
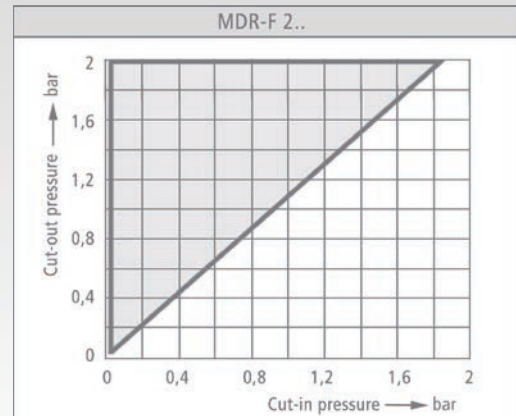
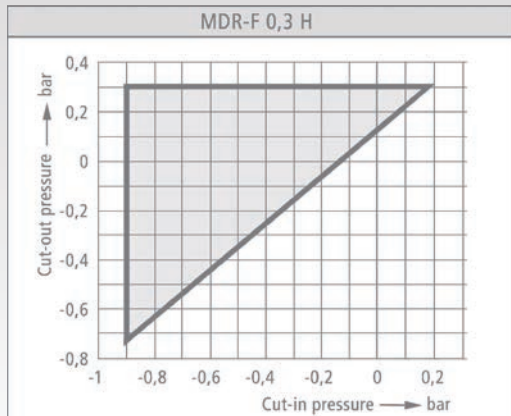
MDR-F D+32

MDR-F Cover

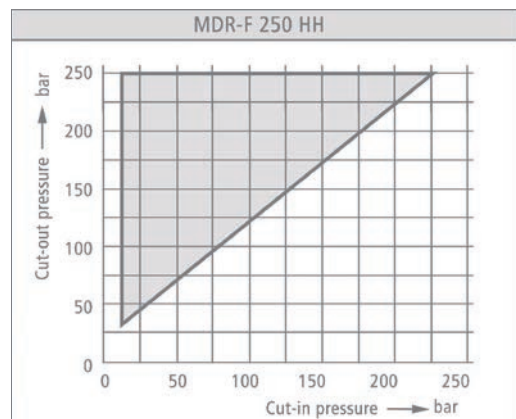
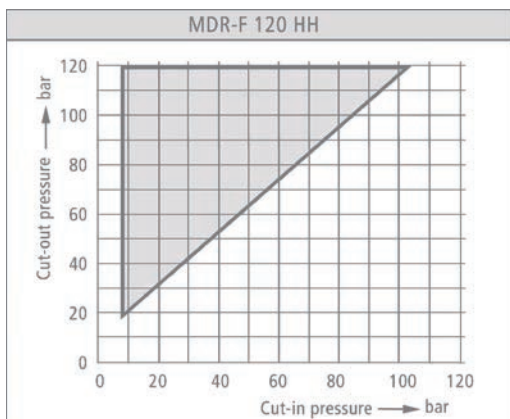
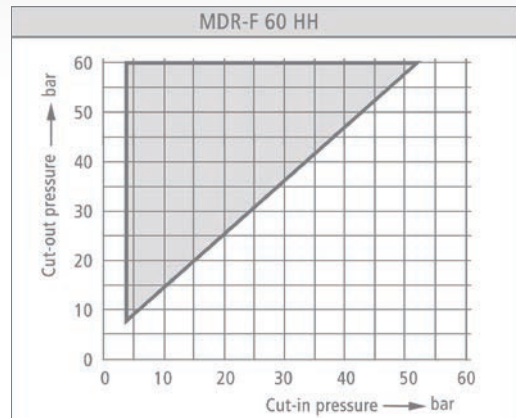
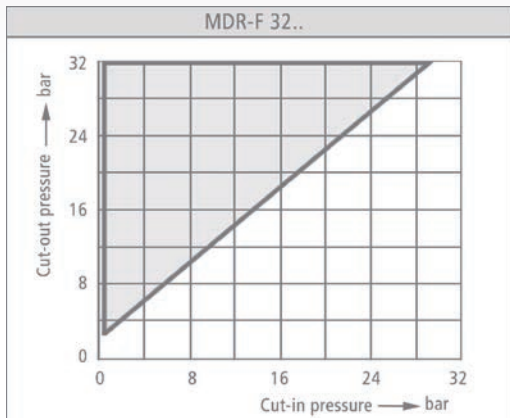
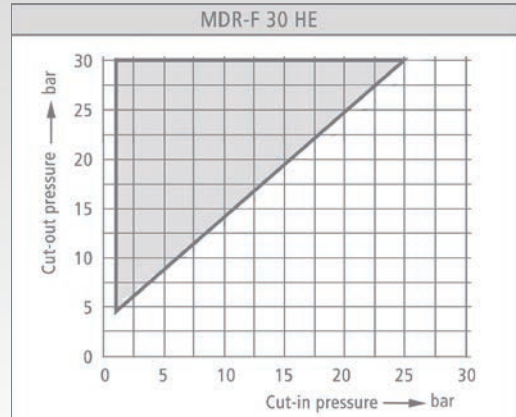
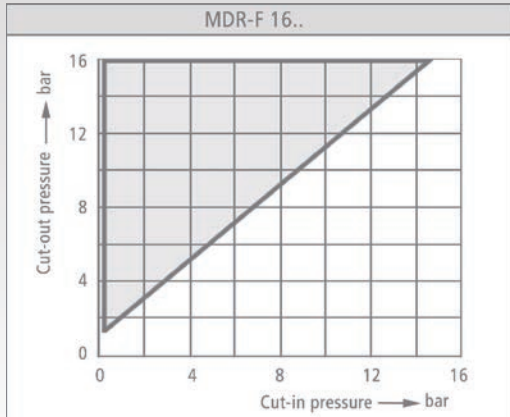
MDR-F Cover R

MDR-F RT-1

Pressure diagrams MDR-F



Pressure diagrams MDR-F



Note: All pressure diagrams do not apply to the "DPDT" version and not for "NO / NC". If needed, upon request.

Control pressure switch MDR - P

...product for industrial customers



- Compact pressure switch
 - Fixed pressure settings
 - High repeatability
 - Customer-specific configuration
 - 1 SPDT
 - Acc. to EN 60947
 - Degree of Protection IP 65
 - Flange = brass
- Primarily for mass production

The CONDOR MDR-P control pressure switch can be universally used. Due to compact design, standardized electrical plug-and-socket connection and high IP protection, this switch is a suitable application for mass productions.

The MDR-P is provided with change-over contacts (SPDT) and is suitable for monitoring and controlling the pressure of liquids or gaseous media.

The cut-in and cut-out pressure settings are set at our factory according to the customer's requirements. A subsequent change of the pressure settings is not provided, but is possible by removing the cover flap.

Technical data MDR P acc. to EN 60947	
Rated operating current I_e AC 1 $U_e=240\text{ V (1~)}$	10 A
Rated operating current I_e AC 15 $U_e=240\text{ V (1~)}$	4 A
Rated operating current I_e DC 13 $U_e=240\text{ V (1~)}$	0,1 A
Permissible motor rating 1~ 230 V	0,55 kW
Mechanical life (AC 15) Cycles	$> 1 \times 10^6$
Mechanical life Cycles	$> 1 \times 10^6$
Max. electrical cycles Cycles/h	600
Max. mechanical cycles Cycles/h	600
Bursting strength P_z	$> 60\text{ bar}$

Technical data MDR P acc. to EN 60947	
Vibration resistance:	4 g (bei 10 bis 1000 Hz)
Temperature range:	- 25 C°** bis + 70 C°
Protection acc. to EN 60529	IP 65

** lower temperatures on request

Media resistance MDR-P
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.

MDR-P

Because the MDR-P was essentially conceived for our product line by the customer, there should be no need to adjust the pressure settings after manufacture.

For the pressure switch to be configured in the factory, the start-up and shutdown pressures are required.

The switching points can be established in two ways, according to the following diagram:

1. Calculation of the possible shutdown pressure with a stated start-up pressure (blue line)

For example, with a start-up pressure of 8 bar, a horizontal line will be plotted in the pressure diagram at the level of the start-up pressure.

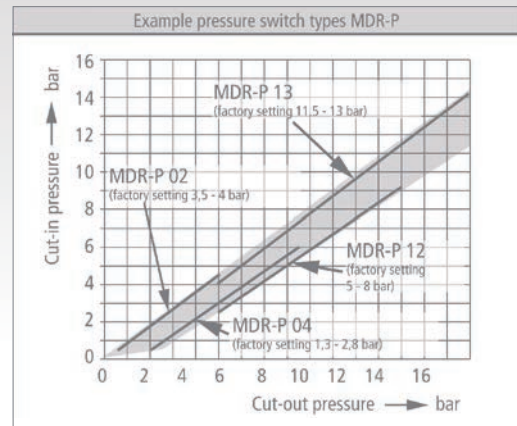
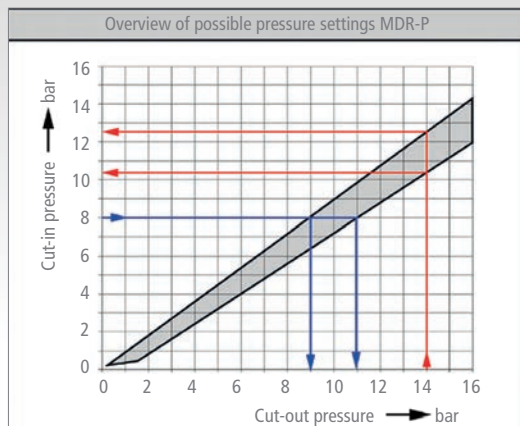
All shutdown pressures in the diagram located on this line, which can be calculated with a vertical line on the coordinates axis, can then be configured. In this case you can select shutdown pressures between 9 and 11 bar.

2. Calculation of the possible start-up pressure with a stated shutdown pressure (red line)

For example, with a shutdown pressure of 14 bar, a vertical line will be plotted in the pressure diagram at the level of the shutdown pressure.

All start-up pressures in the diagram located on this line, which can be calculated with a horizontal line on the coordinates axis, can then be configured.

In this case you can select start-up pressures between 10.4 and 12.5 bar.



Type Overview MDR-P with brass flange

Pressure Switch with NBR diaphragm, 1 SPST, 10-piece packing unit

Pressure connection: G 1/4" outer thread brass, connection configuration according to DIN

Order reference	Adjustable cut-in pressure (bar)	Pressure difference (bar)*	Adjustable cut-out pressure (bar)	Factory setting (bar)	Weight in g pro 10 Stück	Article number
MDR-P 02	0,2...4,5	0,3 ... 0,5	0,5...5	3,5 - 4,0	1050	270027
MDR-P 04	0,5...6	1,5 ... 2,5	2...8,5	1,3 - 2,8	1050	270034
MDR-P 12	2,5...9,2	2,5 ... 3,8	5...13	5,0 - 8,0	1050	270041
MDR-P 13	4...14,2	1,0 ... 1,8	5...16	11,5 - 13	1050	270058

* lower ... upper end of range

More pressure settings on request.

Sample order:

MDR-P

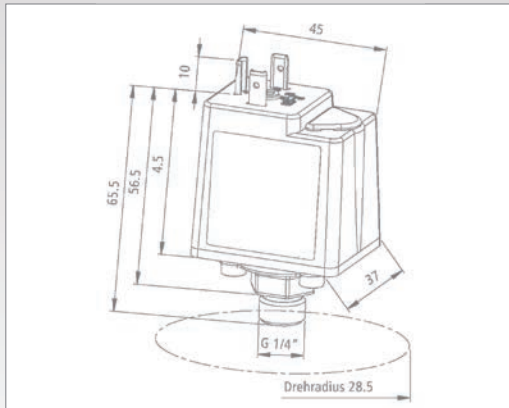
Cut-in pressure setting 1.3 bar or also known as:

Cut-out pressure setting 2.8 bar Article No. 270034

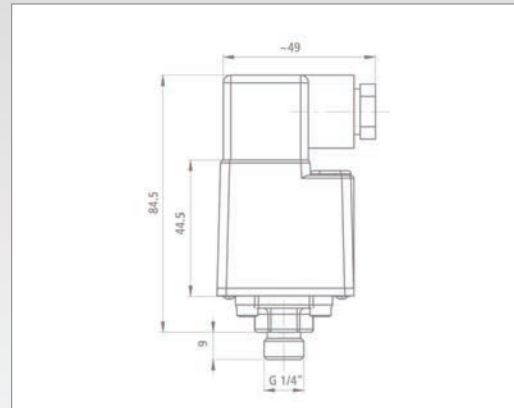
Plug connector according to DIN

Further diaphragm materials and changers with gold contacts available upon request. An available alternative for a DIN plug connection is a special variation (see next page).

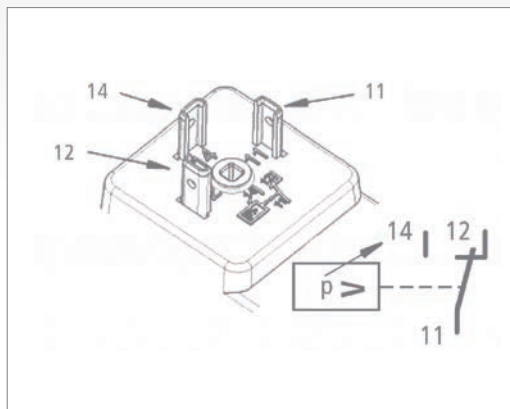
Dimensions / Circuit diagram MDR-P / Configuration of the contacts



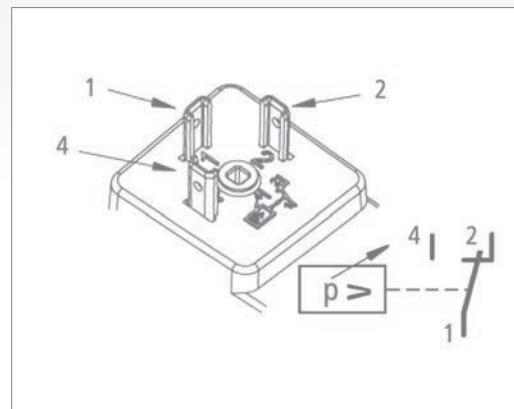
Pressure switch MDR-P



Pressure switch MDR-P



Standard version MDR-P



Special version MDR-P

Accessories MDR-P

Order reference	Description	Weight (in g)	Part No.
	Connection		
MDR-P LD	MDR-P cable socket, 10 pieces (DIN EN 175301-803)	220 g	263951



MDR-P cable socket

Control pressure switch MDR - K

Control pressure switch MDR - K

...product for industrial customers



- Robust control pressure switch
- Simple assembly
- With bayonet coupling
- 2 SPDT's
- Acc. to EN 60947
- Degree of Protection IP 67
- Flange = aluminium die-cast

The MDR-K control pressure switch is distinguished by its robust construction and the fact that it is fitted with 2 sets of change-over contacts. It is ideally suited for applications for which two galvanically isolated contacts are required, regardless of whether they are openers or closers.

This pressure switch was specially designed for use in critical areas (water) or for use outdoors, as it has the highest possible protection rating, IP 67, combined with an electrical connection in the form of a bayonet coupling.

Type overview MDR-K with aluminium die-cast flange

and NBR diaphragm. Pressure switch with bayonet coupling.
Pressure connection: G 3/8" inner thread

Order reference	Type Code	Adjustable cut-in pressure (bar)	Smallest pressure diff. (bar)*	Adjustable cut-out pressure (bar)	Weight (in g)	Part No.
MDR-K 2	MDR-K 2 HAK KCA X 010A020	0,4 ... 1,8	0,1 0,2	0,5 ... 3		264514
MDR-K 6	MDR-K 6 HAK KCA X 030A040	1,3 ... 5,5	0,2 0,5	1,5 ... 7		264521
MDR-K 11	MDR-K 11 HAK KCA X 080A090	5,3 ... 10,4	0,4 0,6	5,7 ... 12		264539

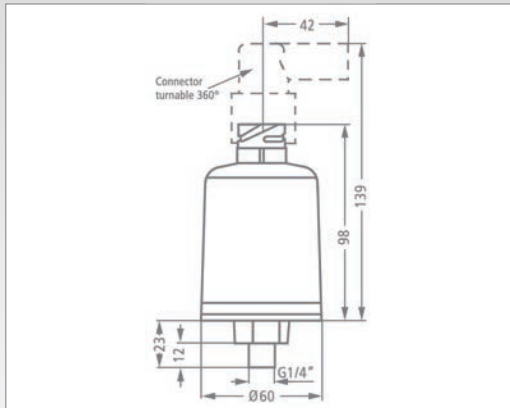
Note: More pressure settings on request.

Technical data MDR K acc. to EN 60947	
Rated operating current I_e AC 1 $U_e=240$ V (1~)	10 A
Rated operating current I_e AC 15 $U_e=240$ V (1~)	4 A
Rated operating current I_e DC 13 $U_e=240$ V (1~)	0,1 A
Permissible motor rating 1~ 230 V	0,55 kW
Mechanical life (AC 15) Cycles	$> 1 \times 10^6$
Mechanical life Cycles	$> 1 \times 10^6$
Max. electrical cycles Cycles/h	600
Max. mechanical cycles Cycles/h	600
Bursting strength Pz	> 60 bar

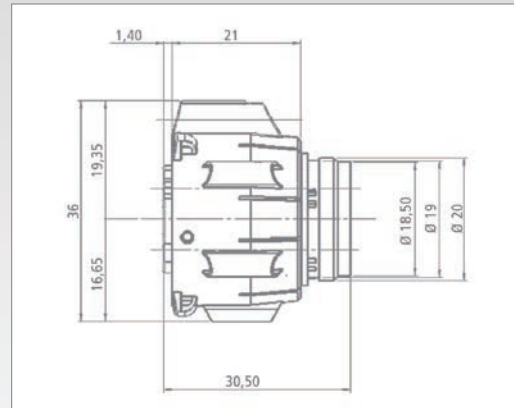
Technical data MDR K acc. to EN 60947	
Vibration resistance	4 g (bei 10 bis 1000 Hz)
Temperature range	- 40 °C bis + 70 °C
Protection acc. to EN 60529	IP 67

Media resistance MDR-K	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

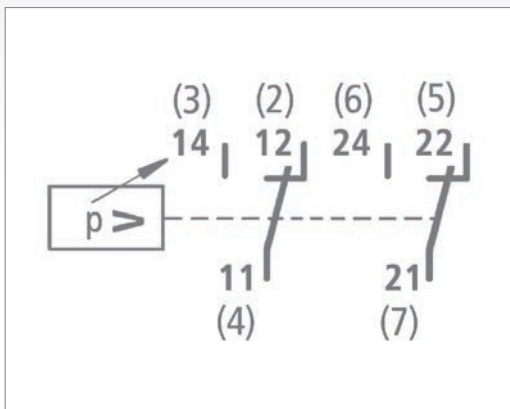
Dimensions / Circuit diagram MDR - K



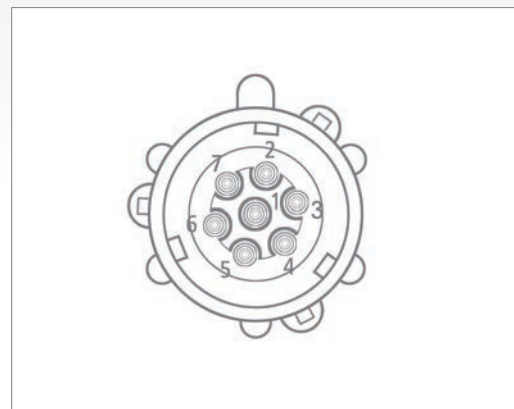
Pressure switch MDR - K



MDR-K bayonet coupling



Circuit diagram MDR - K



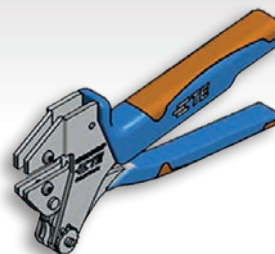
MDR-K bayonet coupling

Accessories MDR-K

Order reference	Description	Weight (in g)	Part No.
	Connection		
MDR-K BK	MDR-K bayonet coupling (ISO 15170-1)	20 g	264545



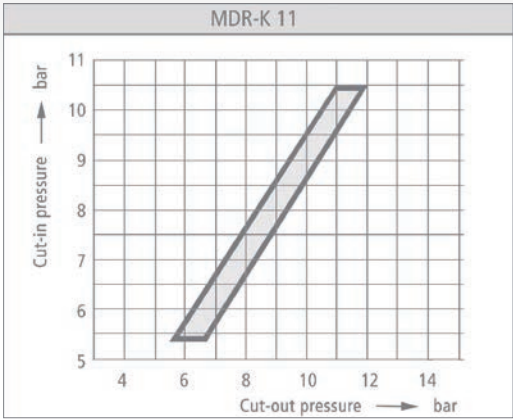
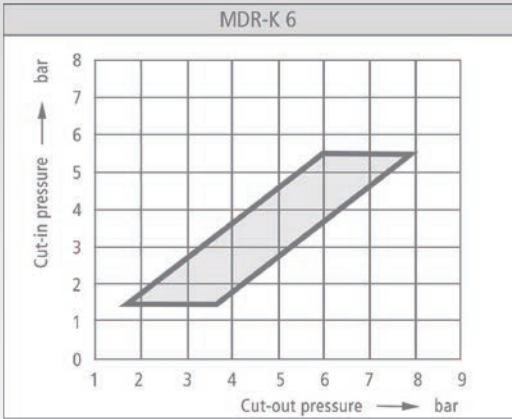
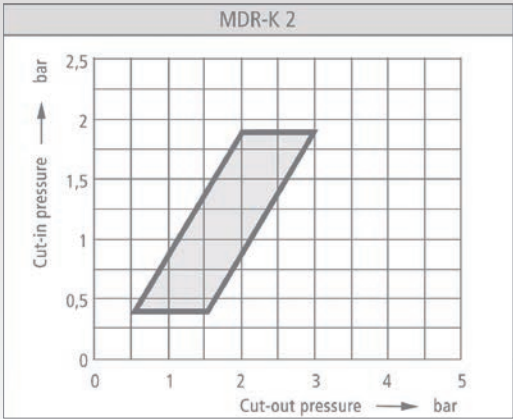
MDR-K bayonet coupling



"Crimping tool"

To connect the six single-core cables 0,75 mm² at the bayonet coupling, a crimping tool is needed (z. Ex. Crimping Hand tool PN539635-1 / Tyco Electronics).

Pressure diagrams MDR - K



Control pressure switch MDR 43



- Max. cut-out pressure 16 bar
- Transparent cover
- 1 N.C. + 1 N.O.
- Acc. to EN 60947
- Flange = Die-cast aluminium

Order reference	Type Code	ON / OFF Rotary knob	Pressure range P _{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 43/3	MDR-43 BAA BAAA xxxA020 XAA XXX	-	0,5 - 3	G 1/2" Alu	420	212775
MDR 43/3	MDR-43 BBA BAAA xxxA020 XAA XXX	-	0,5 - 3	G 1/4" Alu	420	212782
MDR 43/6	MDR-43 DAA BAAA xxxA040 XAA XXX	-	2,5 - 6	G 1/2" Alu	420	212799
MDR 43/6	MDR-43 DBA BAAA xxxA040 XAA XXX	-	2,5 - 6	G 1/4" Alu	420	212805
MDR 43/11	MDR-43 GAA BAAA xxxA090 XAA XXX	-	5 - 11	G 1/2" Alu	420	212812
MDR 43/11	MDR-43 GBA BAAA xxxA090 XAA XXX	-	5 - 11	G 1/4" Alu	420	212829
MDR 43/16	MDR-43 HAA BAAA xxxA120 XAA XXX	-	8 - 16	G 1/2" Alu	420	212836
MDR 43/16	MDR-43 HBA BAAA xxxA120 XAA XXX	-	8 - 16	G 1/4" Alu	420	212843

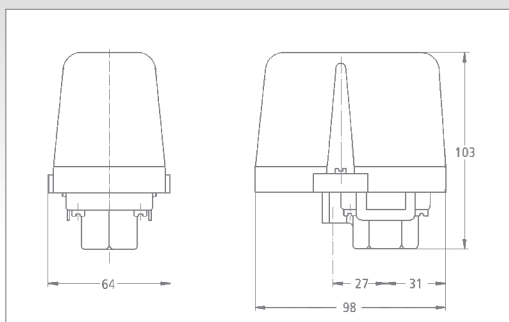
Cut-in pressure is tightest possible pressure differential  The cut-out pressure is preset 
Cable glands for retrofit assembly to be ordered separately, see accessories

Technical Data MDR 43 acc. to EN 60947	
Rated insulation voltage U _i	500 V
Rated insulation voltage U _e (AC 15)	250 V
Rated insulation voltage I _{the} (AC 15)	8 A
Rated insulation voltage I _e (max.)	10 A
Mechanical life (AC 15) Cycles	> 1,5 x 10 ⁵
Mechanical life Cycles	> 1 x 10 ⁶
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	600
Bursting strength P _z	> 60 bar

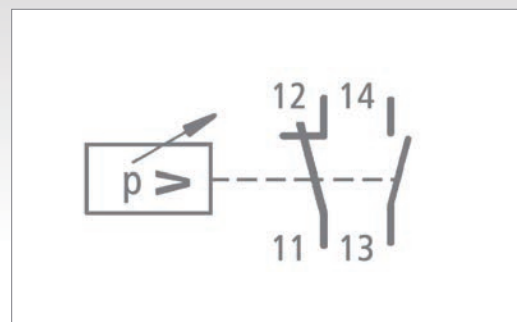
Technical Data MDR 43 acc. to EN 60947	
Permissible medium temperature Air	- 30...+ 80 °C
Permissible medium temperature Water	+ 80 °C
Conductor cross-section 1 .. flexible cable 1 x / 2 x	2,5 / 2,5mm ²
Conductor cross-section 1 ... rigid cable 1 x / 2 x	2,5 / 2,5mm ²

Diaphragm media resistance MDR 43	
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.	

Dimensions / Circuit Diagrams MDR 43



Pressure switch MDR 43

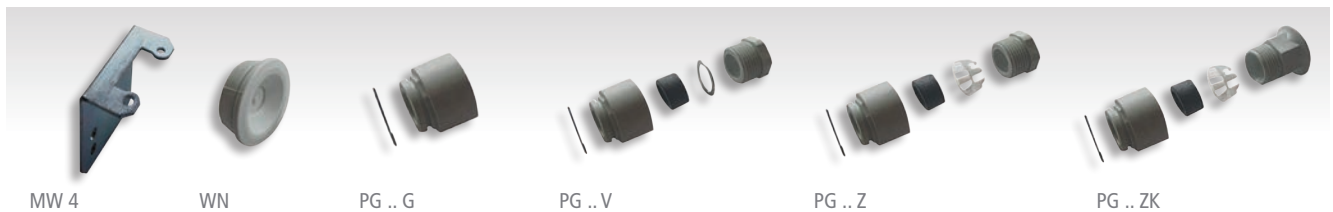


Control pressure switch MDR 43

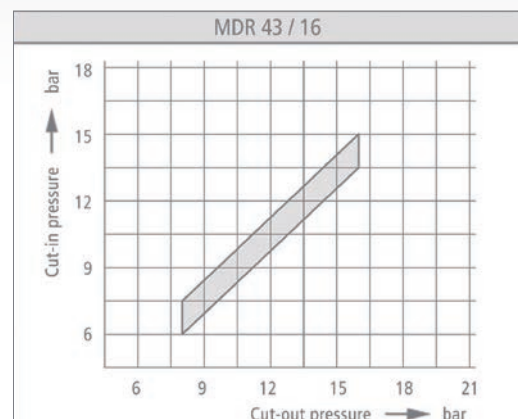
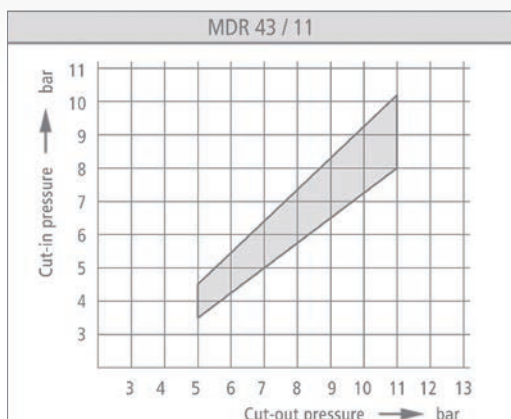
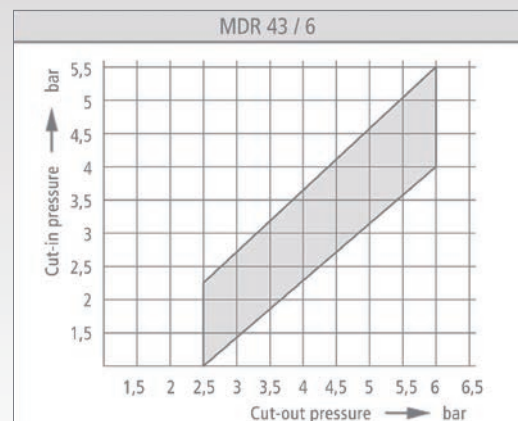
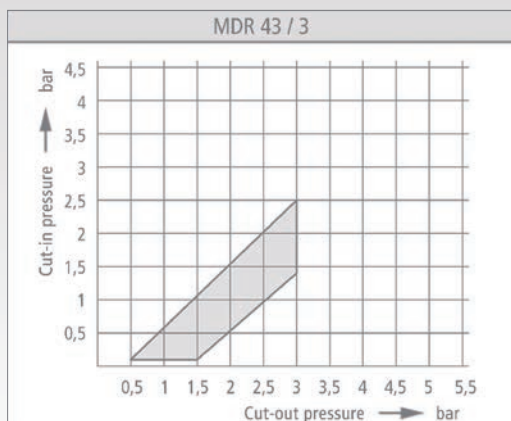
Accessories MDR 43

Order reference	Description	Weight (in g)	Part No.
Cable glands			
WN	Grommet	6	200888
PG 11 G	Conduits for mounting cable glands (inner thread)	6	200895
PG 11 V	Cable glands complete	12	200901
PG 11 Z	With strain relief	12	200925
PG 11 ZK	With strain relief and cable support	12	200918
PG 13,5 G	Conduits for mounting cable glands (inner thread)	6	200963
PG 13,5 V	Cable glands complete	12	200932
PG 13,5 Z	With strain relief	12	200956
PG 13,5 ZK	With strain relief and cable support	12	200949
MW 4	Mounting bracket for MDR 4 and MDR 43	65	230021
Cover			
H43 (Cover MDR 43)	Cover (Transparent)	70	230038

Wall-mounting bracket / Cable glands MDR 43



Pressure Diagrams MDR 43



Control pressure switch MDR 53



- Max. cut-out pressure 16 bar
- Ample wiring room
- High switching accuracy
- 1 SPDT
- Acc. to EN 60947
- Flange = Die-cast aluminium

Order reference	Type Code	ON / OFF Rotary knob	Pressure range P_{OFF} in bar	Flange	Weight (in g)	Part No.
MDR 53/8	MDR-53 EAA BAAA xxxA080 XAA XXX	-	0,5 - 8	G 1/2" Alu	740	213079
MDR 53/11	MDR-53 GAA BAAA xxxA110 XAA XXX*	-	6 - 11	G 1/2" Alu	780	216919
MDR 53/16	MDR-53 HAA BAAA xxxA160 XAA XXX	-	6 - 16	G 1/2" Alu	780	213086
MDR /25 SO3	MDR-53 NAA BAAA xxxA030 XAA XXX**	-	bis 3	G 1/2" Alu	740	213130
MDR /25 SO8	MDR-53 OAA BAAA xxxA080 XAA XXX**	-	bis 8	G 1/2" Alu	740	213147

* xxx = Cut-out pressure is preset, cut-in pressure is the tightest possible pressure differential.

** xxx = Cut-out pressure is preset, cut-in pressure is the tightest possible pressure differential and pressure-resistant up to 25 bar, SO-Type.

A screw plug is also supplied.

Cable glands for retrofit assembly to be ordered separately, see accessories!

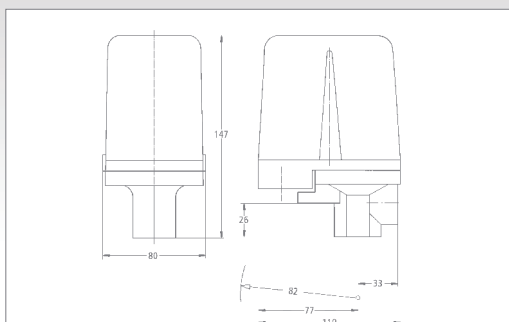
Technical Data MDR 53 acc. to EN 60947	
Rated insulation voltage U_i	500 V
Rated insulation voltage U_e (AC 15)	250 V
Rated insulation voltage I_e (AC 15)	4 A
Rated insulation voltage I_{the} (max.)	10 A
Electrical life (AC 15) Cycles	$> 2 \times 10^5$
Mechanical life Cycles	$> 2 \times 10^6$
Max. electrical cycles Cycles/h	120
Max. mechanical cycles Cycles/h	1200
Bursting strength P_z	> 40 bar
Protection acc. to EN 60529	IP 54

Technical Data MDR 53 acc. to EN 60947	
Permissible medium temperature Air	- 30...+ 80 °C
Permissible medium temperature Water	+ 80 °C
Conductor cross-section 1 .. flexible cable 1 x / 2 x	2,5 / 2,5mm ²
Conductor cross-section 1 ... rigid cable 1 x / 2 x	2,5 / 2,5mm ²

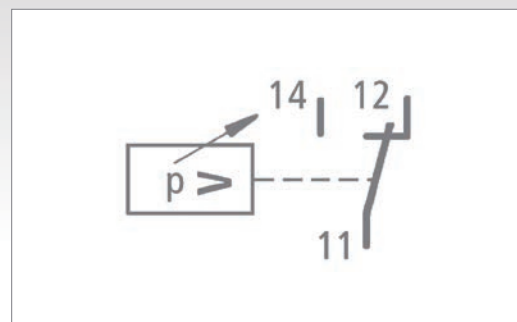
Diaphragm media resistance MDR 53
A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22. Please read the information carefully.

A detailed overview of diaphragm media resistance for all pressure switches can be found on page 22.

Dimensions / Circuit Diagrams MDR 53



Pressure switch MDR-53



Control pressure switch MDR 53

Accessories MDR 53

Order reference	Description	Weight (in g)	Part No.
	Cable glands		
WN-M20	Grommet	6	269496
VS-M20	Screw plug M20		269502
M20 Z	With strain relief, clamping range 6-12 mm	12	269533
M20 ZK	With strain relief and cable support, clamping range 6-12 mm	12	269540
M20 L	With strain relief, clamping range 10-14 mm	12	269519
M20 LK	With strain relief and cable support, clamping range 10-14 mm	12	269526
MW 5	Mounting bracket	120	230045
	Cover		
H5 (Cover MDR 5)	Cover without On/Off push-buttons	130	230052

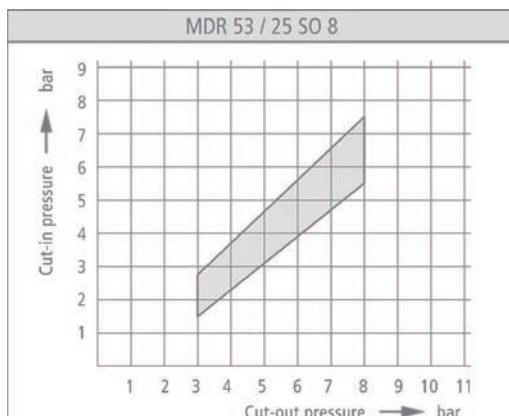
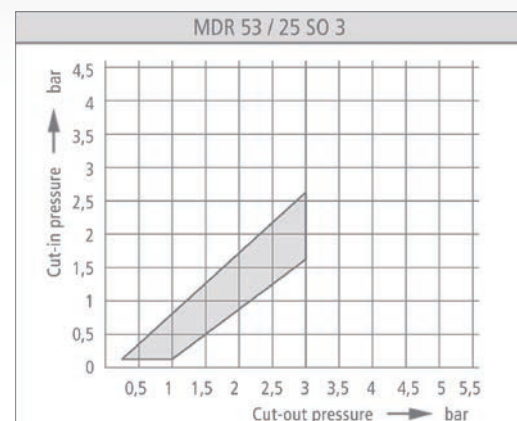
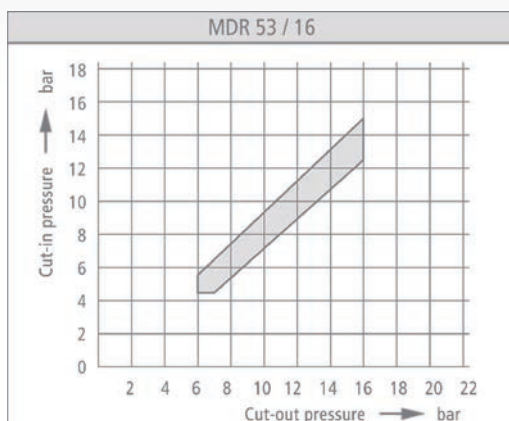
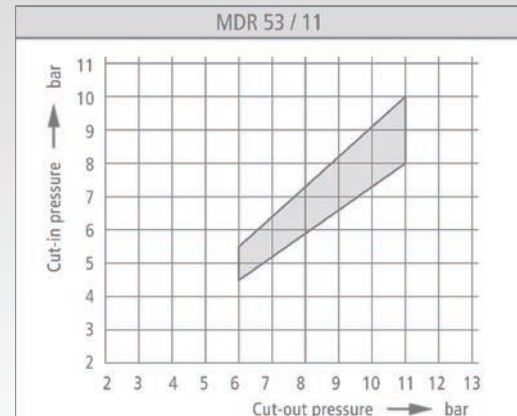
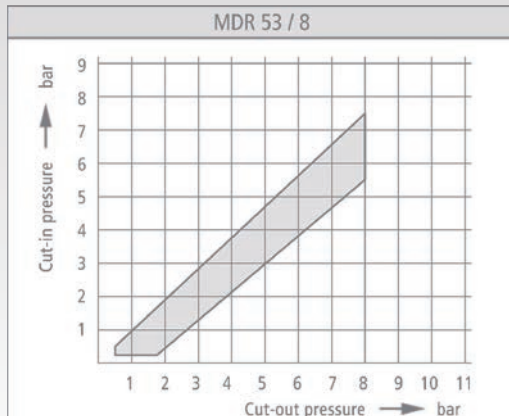
Cable glands MDR 53



Accessories, Wall-mounting bracket / Cover MDR 53



Pressure Diagrams MDR 53







Electronic pressure transducers / sensors and controls /

Industries



EDI Electronic pressure transducer
Pressure range up to 16 bar
Output signal 4 - 20 mA

P. 85 Compressors, water management
liquid and gaseous media

EDS Electronic pressure sensor
Pressure range up to 16 bar
Output signal 4 - 20 mA

P. 86 Compressors, water management
liquid and gaseous media

EDR Electronic pressure control
Pressure range up to 16 bar
Output signal 0 - 10 V

P. 87 Compressors, water management
liquid and gaseous media

EDRA Electronic pressure control
with digital display
Pressure range up to 16 bar
Relay output

P. 89 Compressors, water management
liquid and gaseous media



Compressors

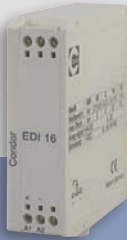
Industries



GLW 4 Electronic staging and sequencing control

P. 92 Compressors, water management

Pressure transducer EDI



- Pressure range up to 16 bar
- for panel board mounting
- Output signal: 4 - 20 mA

Electronic pressure transducer with integrated relative pressure sensor for panel board mounting, quick-connect for pneumatic tube, analogue output 4 to 20 mA and operating voltage 12...30 V-DC.

Function: the device converts the pressure applied to the sensor into a proportional DC-current (2 - wire technology).

Order reference	Measuring range (bar)*	Max. perm. pressure (bar)	Max. inaccuracy at 25° C	Operating voltage U_B (V-DC)	Weight (in g)	Part No.
EDI 10	0 - 10	25	2,5 %	12...30	85	260219
EDI 16	0 - 16	25	2,5 %	12...30	85	260226

*4 mA = 0 bar / 20 mA = measuring range end value

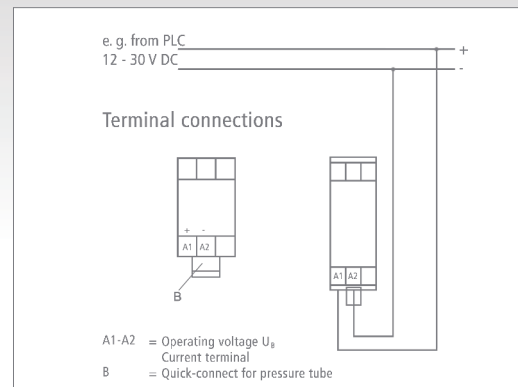
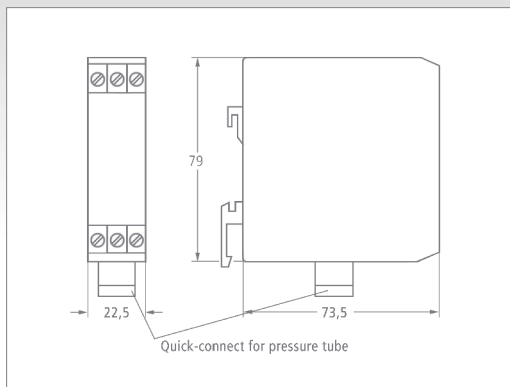
Technical operating data	
Permissible operating voltage range	$\pm 10 \%$
Operating voltage influence at $\pm 10\%$ operating voltage fluctuation	$< 0,1\%$
Duty factor ED	100 %
Permissible ambient and media temperature	-20°C bis +60°C
Permissible ambient humidity rel. humidity, non-condensing	10 % bis 90 %
Permissible storage temperature	-40°C bis +80°C
Clearance and creepage distances	VDE 0110
Working position	beliebig
Power consumption	max. 1 VA

Pressure connection	
Quick-connect suitable pneumatic tube	6 x 1 mm Festo PAN

Output signal	
Analogue output	4 - 20 mA

Enclosure	
Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure-protection	IP 40
Protection against shock	acc. VBG 4
Terminals	Cage clamps
Cross section	2,5 mm ²
Weight	85 g

Dimensions- / Circuit Diagrams EDI



Pressure sensor EDS



- Pressure range up to 16 bar
- Output signal: 4 - 20 mA

Electronic pressure control with relative pressure sensor for direct installation either on or within a device, G 1/4" connection, analogue output 4 - 20 mA and operating voltage supply 11 ... 30 V DC. Electrical connection is effected in a straight forward and service-friendly manner - via a DIN.

A plug whereby a degree of protection IP 65 is realized.

Function: the device converts the pressure applied to the sensor into a proportional DC current (2 - wire technology).

Order reference	Measuring range (bar)*	Max. perm. pressure (bar)	Max. inaccuracy at 25° C	Operating voltage U_g (V-DC)	Weight (in g)	Part No.
EDS 6	0 - 6	32	2,5 %	11...30	150	260233
EDS 10	0 - 10	32	2,5 %	11...30	150	260240
EDS 16	0 - 16	32	2,5 %	11...30	150	260257

*4 mA = 0 bar / 20 mA = measuring range end value

Accessories EDS

Order reference	Description	Weight (in g)	Part No.
EDS-ST	connection socket EDS, DIN 43650-A	110	260264

Technical operating data

Permissible operating voltage range	± 10 %
Operating voltage influence at ± 10% operating voltage fluctuation	< 0,1 %
Duty factor ED	100 %
Permissible ambient and media temperature	15°C bis +80°C
Permissible ambient humidity rel. humidity, non-condensing	10 % bis 90 %
Permissible storage temperature	-40°C bis +80°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 1 VA

Pressure connection

Flange	G 1/4"
Outer thread	

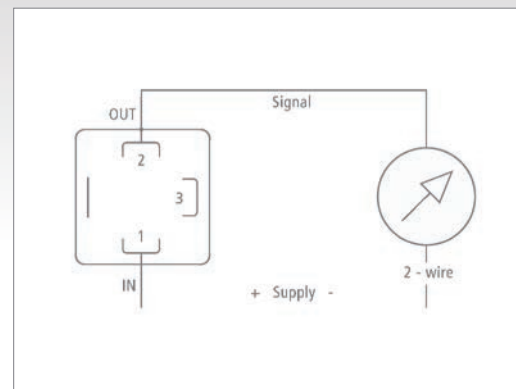
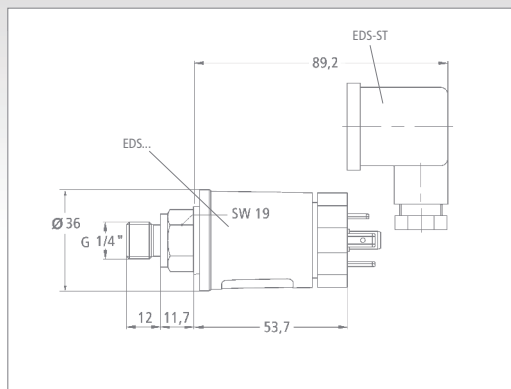
Output signal

Analogue output	4 - 20 mA
-----------------	-----------

Enclosure

Enclosure-protection	max. IP 65
Terminals	Flachstecker 4,5 mm
Cross section	EDS-ST 1,5 mm²
Weight	150 g

Dimensions- / Circuit Diagrams EDS



Electronic pressure control EDR



- Pressure range up to 16 bar
- For panel board mounting
- Relay output
- Output signal: 0 – 10 V

Electronic pressure switch with integrated relative pressure sensor for panel board mounting, quick-connect for pneumatic tube, two fixed adjustable switching points, relay output (isolated SPDT), analogue

voltage output 0-10 V via jack plug (look at accessories) and isolating transformer acc. to VDE 0550.

Function: The device evaluates the applied pressure. On exceeding an upper threshold the relay is deactivated; when falling below a lower threshold the relay is activated again. Both thresholds are adjustable.

Order reference	Measuring range (bar) *	Max. perm. pressure (bar)	Max. inaccuracy at 25° C	Operating voltage U _B (V-DC)	Weight (in g)	Part No.
EDR 2	0,2 - 2	3	2,5 %	230	135	260271
EDR 16	1 - 16	25	2,5 %	230	135	260288

*adjustable in 0.1 bar steps

0 V = 0 bar / 10 V = measuring range end value

Accessories EDR

Order reference	Description	Weight (in g)	Part No.
KL-S	Jack 2.5 mm for analogue output connection (cable length 5 m)	15	260332

Technical operating data

Permissible operating voltage range	± 10 %
Operating voltage influence at ± 10% operating voltage fluctuation	< 0,1 %
Duty factor ED	100 %
Permissible ambient and media temperature	-20°C bis +60°C
Permissible ambient humidity rel. humidity, non-condensing	10 % bis 90 %
Permissible storage temperature	-40°C bis +80°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 1 VA

Pressure connection

Quick-connect suitable pneumatic tube e.g.	6 x 1 mm Festo PAN
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Output signal

Analogue voltage signal max. 5 mA short-circuit proof	0 - 10 V
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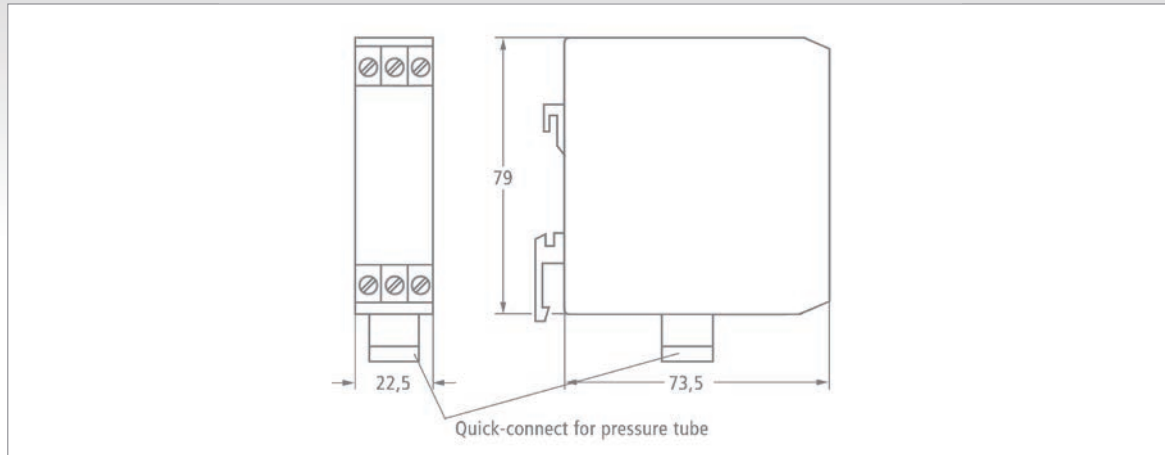
Enclosure

Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure-protection	IP 40
Protection against shock	acc. VBG 4
Terminals	Cage clamps
Cross section	2,5 mm ²
Weight	135 g
Male jack plug Jack 2,5 mm	2,5 mm

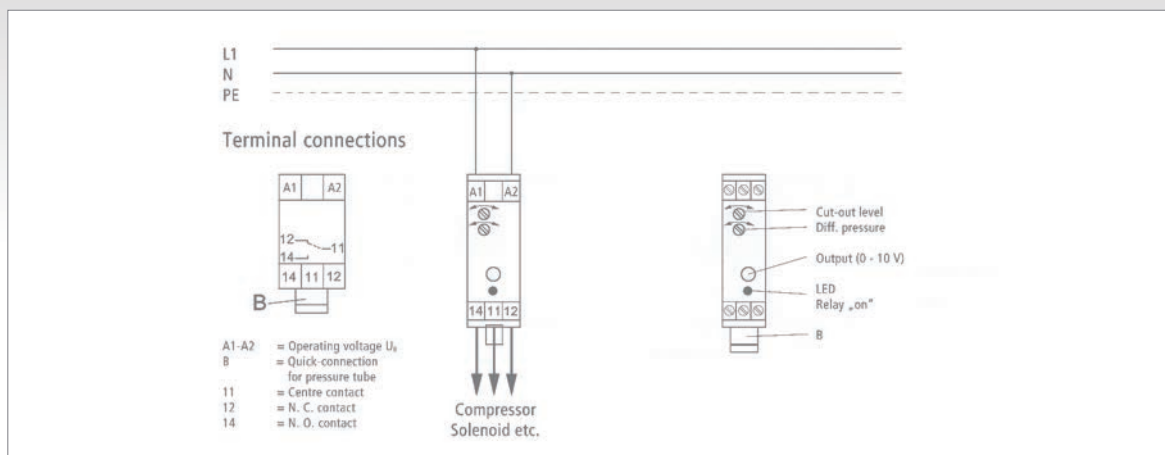
Power section

Series voltage acc. to VDE 0660 and VDE 0110 Group C	250 V-AC
Maximum continuous current per contact	6 A-AC
Maximum switching capacity per contact	1.500 VA (AC) 50 W (DC)
Mechanical life Cycles	ca. 1 x 10 ⁷
Electrical life (max. load) Cycles	ca. 2 x 10 ⁵

Dimensions EDR



Circuit Diagram EDR



Pressure control EDRA



- Pressure range up to 16 bar
- For panel board mounting
- Relay output
- Digital display

Electronic pressure switch with integrated relative pressure sensor for panel board mounting, quick-connect for pneumatic tube, digital display for mains pressure indication and threshold programming (two switching points), relay output (isolated SPDT) and isolating transformer acc. to VDE 0550.

Function: The device evaluates the applied pressure to the sensor. On exceeding an upper threshold the relay is deactivated; when falling below a lower threshold the relay is activated again. Both thresholds also are adjustable without medium. The on/off thresholds can be programmed via the display during operation - the actual pressure status is shown on the display.

Order reference	Measuring range (bar) *	Max. perm. pressure (bar)	Max. inaccuracy at 25° C	Operating voltage U_B (V-DC)	Weight (in g)	Part No.
EDRA 16	1 - 16	25	2,5 %	230	255	260295

*adjustable in 0.1 bar steps

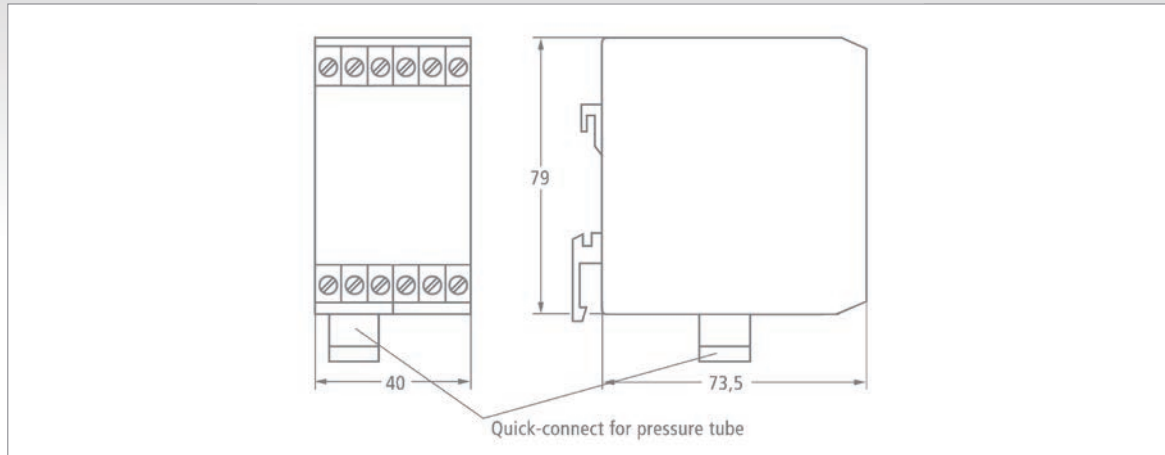
Technical operating data	
Permissible operating voltage range	± 10 %
Operating voltage influence at ± 10% operating voltage fluctuation	< 0,1 %
Duty factor ED	100 %
Permissible ambient and media temperature	-20°C bis +60°C
Permissible ambient humidity rel. humidity, non-condensing	10 % bis 90 %
Permissible storage temperature	-40°C bis +80°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 1 VA

Pressure connection	
Quick-connect suitable pneumatic tube e.g	6 x 1 mm Festo PAN

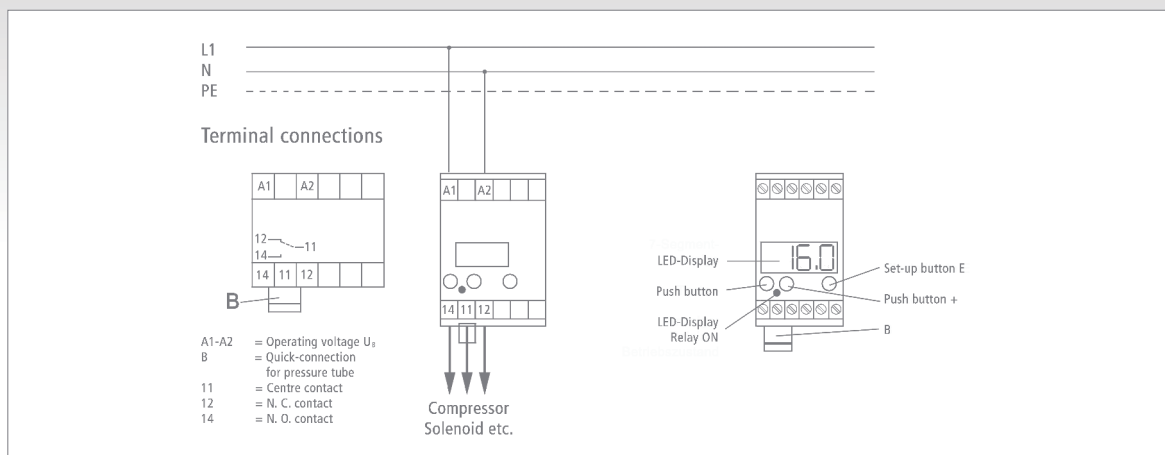
Enclosure	
Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure-protection	IP 40
Protection against shock	acc. VBG 4
Terminals	Cage clamps
Cross section	2,5 mm ²
Weight	255 g

Power section	
Series voltage acc. to VDE 0660 and VDE 0110 Group C	250 V-AC
Maximum continuous current per contact	6 A-AC
Maximum switching capacity per contact	1.500 VA (AC) 50 W (DC)
Mechanical life Cycles	approx. 1 x 10 ⁷
Electrical life (max. load) Cycles	approx. 2 x 10 ⁵

Dimensions EDRA



Circuit Diagram EDRA





Staging and Sequencing Control for Compressors



More and more companies today need an economic operating air pressure system.

an internal timer is available e.g. shift work applications.

Thereby, several compressors are often connected to each other. Since 1995 Condor GLW controls have been used to monitor up to 4 compressors in primary load set up.

The GLW 4 evaluates the mains pressure and rotates the connected compressors on a time-dependent basis. If desired,

Following functions can be activated:

- Internal pressure transducer 0 to 16 bar
- Connection of an external pressure transducer, two-wire 4 to 20mA
- Programmable internal time switch (controls up to 6 profiles)
- Programmable primary load and load changeover functions, allowing for the primary load compressor to operate without taking part in the rotation process. Only the load changeover compressors are rotated.
- Programmable ball valve control with max. 3 compressors
- Direct switchover after the load changeover time has elapsed.
- Four digital inputs (e.g. for hourmeter)
- Input: bridge time switch
- Input: remote release
- Parameter password protection
- Units reversible bar/psi

Type overview GLW 4

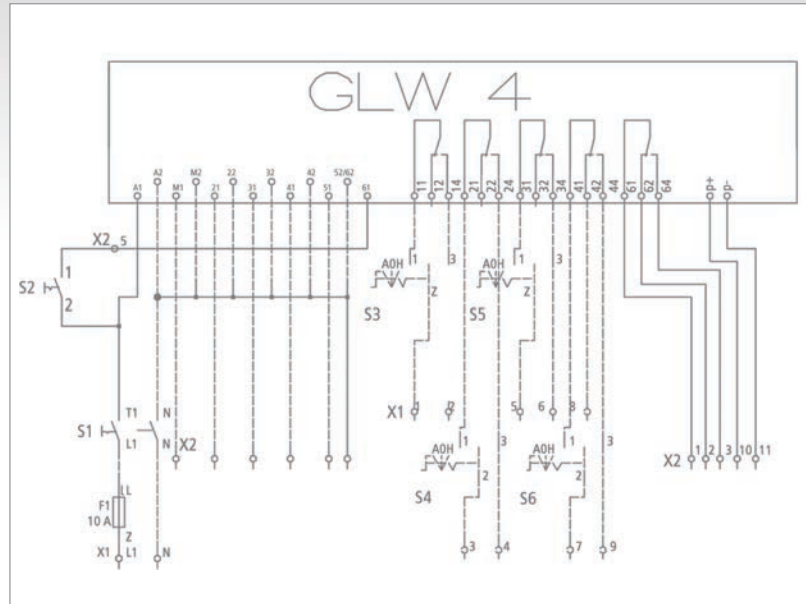


Order reference	Description	Weight (in g)	Part No.
GLW 4	GLW 4 without wiring, enclosure	520	237761
GLW 4-S	GLW 4 in pre-wired plastic enclosure, (dimensions: 420x300 x170mm), DIN-Rail mounting, internal terminal blocks and wiring diagram.	2350	255475
GLW 4-S kompl.	GLW 4 in pre-wired plastic enclosure, (dimensions: 420x300 x170mm), DIN-Rail mounting, internal terminal blocks and wiring diagram. Additionally wired for 4 compressors: isolator, rotary switch „bridge timer“, rotary switch compressor 1 - 4, indicator lamps for voltage supply and compressors 1 – 4.	3550	255482

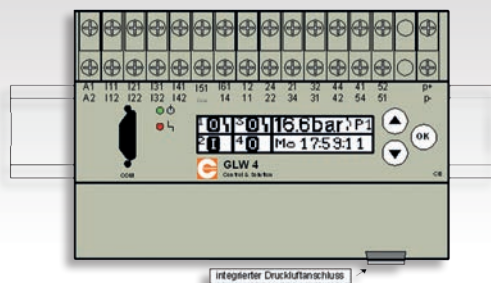
Additional styles on demand!

Electronic staging and sequencing control GLW 4

Wiring diagram GLW 4-S (completely assembled)



Housing GLW 4 Terminal connections



Electronic staging and sequencing control GLW 4

Technical operating data	
Permissible operating voltage range U_B	90 – 265 V AC 50 – 60 Hz
Operating voltage influence at $\pm 10\%$ operating voltage fluctuation	$< 0,1 \%$
Duty factor ED	100 %
Permissible ambient and media temperature	-20°C up to $+60^\circ\text{C}$
Permissible ambient humidity rel. humidity, non-condensing	10 % up to 90 %
Permissible storage temperature	-40°C up to $+80^\circ\text{C}$
Clearance and creepage distances	VDE 0110
Working position	Any position
Power consumption Control	10 VA

Power section	
Series voltage acc. to VDE 0660 and VDE 0110 Group C	250 V-AC
Maximum continuous current per contact	6 A-AC
Maximum switching capacity per contact	1.500 VA (AC) 50 W (DC)
Mechanical life Cycles	approx. 1×10^7
Electrical life (max load) Cycles	approx. 2×10^5

Measuring accuracy and Requirements	
Input external pressure transducer	$\pm 2\%$ of end value
Internal pressure transducer	$\pm 2\%$ of end value
EM-Directive	89 / 336 / EWG
Low Voltage Directive	73 / 23 / EW

Digital in- and outputs	
4 Relay outputs isolated SPDT's	230V-AC; 5 A (AC1)
1 Alarm relay isolated SPDT	230V-AC; 5 A (AC1)
Internal buzzer	typical 70dBA
4 digital inputs 250V	AC 1 (I11/I12 I41/I42)
Input 250V-AC1 (I51/52)	External release signal
Bridge time switch	250V-AC1 (I61/62)

Analogue Interface	
Input analogue pressure transducer U_B 4...20mA wire	18 – 21V-DC
Integrated pressure transducer With quick connect	0...16 bar

Enclosure	
Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure-protection	IP 40
Protection against shock	acc. VBG 4
Terminals	Cage clamps
Cross section	2,5 mm ²
Weight	520 g

Pressure connection	
Pneumatic tube diameter suitable pneumatic tube e.g.	6 x 1 mm Festo PAN



Pump control CPS B1

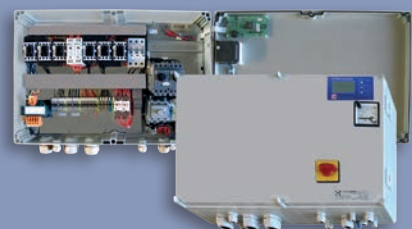


Level control

Industries



→	Level measurement methods	P. 97	
PSN	Float switches which turns On and Off depending on the cable length	P. 101	Fill level switch in wastewater pumping stations, used water tanks, stormwater utilization systems, sump pits, etc. for direct and indirect control of pumps.
ENP	Electronic pump control Single and dual pump control with monitoring functions	P. 105	Electronic level controls are used where fill levels in tanks and pits have to be kept at an exact level or where fluids should be pumped out.
ENR	Electronic level relay Measuring range 0,1 – 2 m Output signal 0 - 10 V	P. 107	
HRH-5	Electronic level relay For level monitoring	P. 109	Electrode relays monitor the fill levels of conductive fluids by means of rod or dipped electrodes in tanks.
ENS	Stainless steel level sensor Output signal 4 - 20 mA	P. 111	For constant detection of minimal changes in water level in shafts and pits, larger pump stations for wastewater or stormwater drainage, with and without the risk of explosions.
→	Accessories: Bells and accessories for Level Monitoring	P. 113	Bell plungers: robust and maintenance-friendly solution for detecting fill levels in pressurized drainage systems, small pump stations, sewage collection shafts. Approved for use in explosion-risk areas.



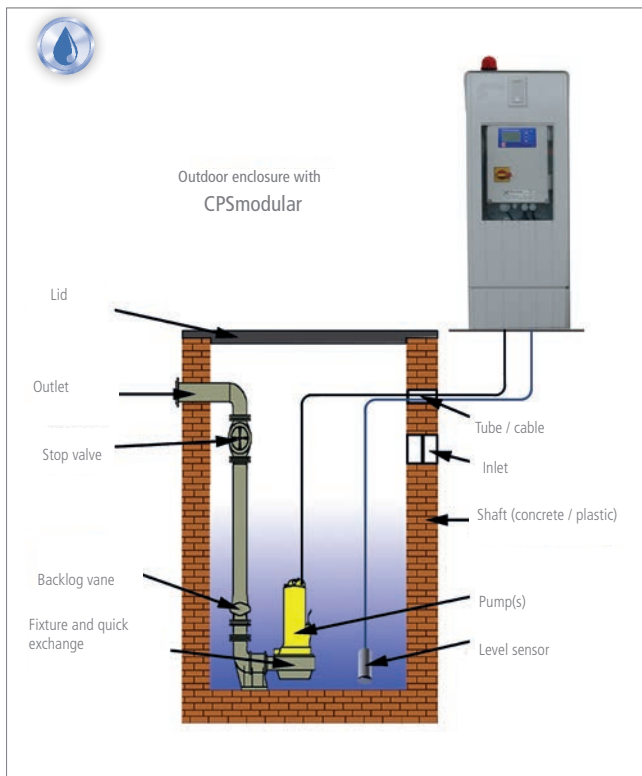
Pump control

Industries



CPS-B/CPS-L	NEW!	Basis pump control	P. 115	Electronic control for level-dependent pump power controls, from 0.5 KW to 4 KW, for building drainage systems and pressurized drainage systems, as both single and double pump stations.
CPS-M		Modular pump control	P. 118	Electronic control for level-dependent pump power controls, from 0.5 KW to 75 KW, for municipal intermediate and main pumping stations, as single, double or multiple pump stations.
CPS-B/CPS-L/CPS-M/CPS-M PLUS	NEW!	Equipment features	P. 120	

For level measurement there are different methods that can be used



1. Level measurement method using float switches
2. Impact pressure
 - 2.1 Impact pressure method in closed systems
 - 2.2 Impact pressure method in open systems
 - 2.2.1 Open system method with air replenishment
 - 2.2.2 Open system method with bubblers
3. Conductivity measurement method
4. Hydrostatic measurement method (ENS)

1. Description float switches



In this application, contacts placed within a floating enclosure are closed / opened depending on the inclination angle of the float switch.



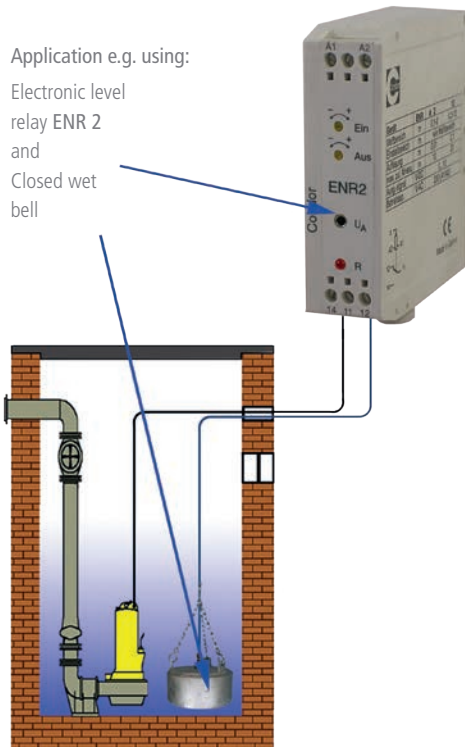
Application e.g. using:

Float switches
PSN – O

2.1 Impact pressure method, closed system



Application e.g. using:
Electronic level
relay ENR 2
and
Closed wet
bell



In this application the level change is transmitted via a pneumatic tube to the sensor and evaluated. The two types of systems - closed and open - are described in more detail below:

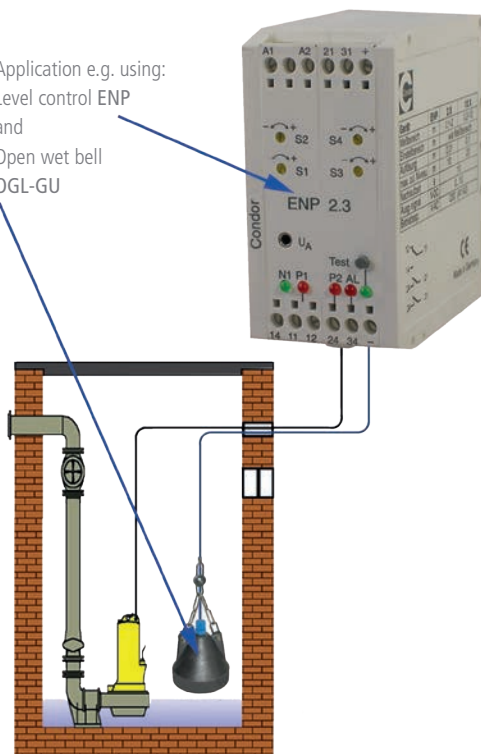
Closed system

For the use of a closed system, a completely sealed measuring system is an absolute necessity. A leak in the system, through which air can diffuse, leads to a drop in pressure and subsequently a malfunction of the device. The sealed bell GGL-8 (see accessories section) placed into the medium seals the measurement system at the "measuring point".

2.2.1 Impact pressure method, open system with air replenishment



Application e.g. using:
Level control ENP
and
Open wet bell
OGL-GU



Open systems

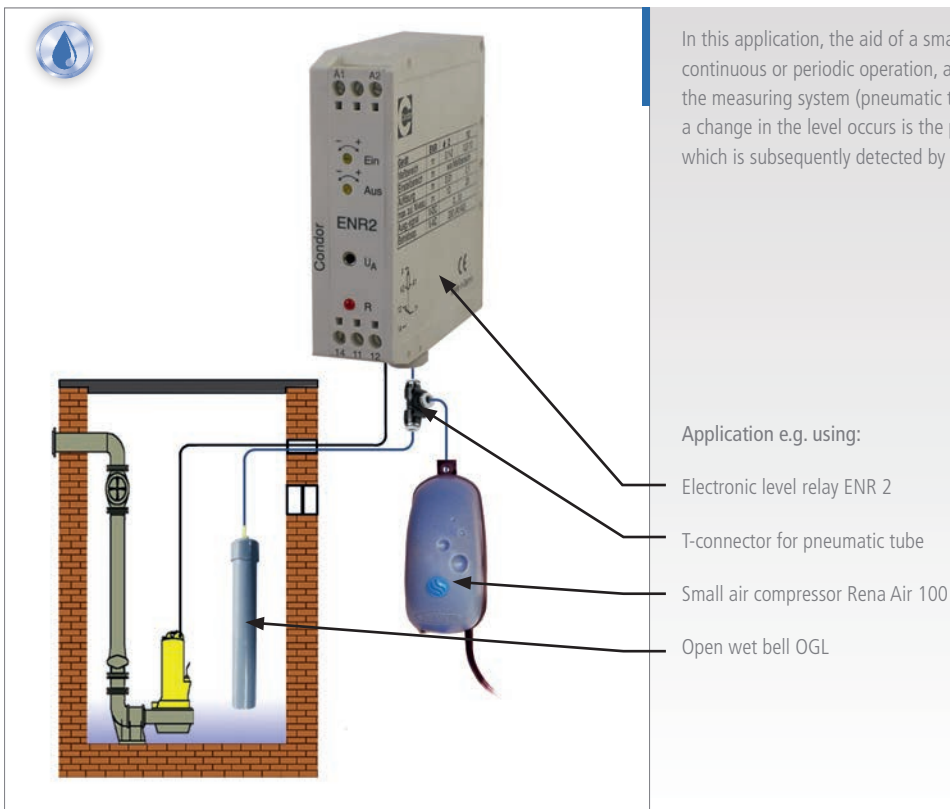
In open systems, the medium to be monitored creates pressure inside the pneumatic tube which is then electronically evaluated. Any leaks, which could lead to false measurement results, can be compensated for by suitable aeration or by bubbler operation.

Air replenishment operation

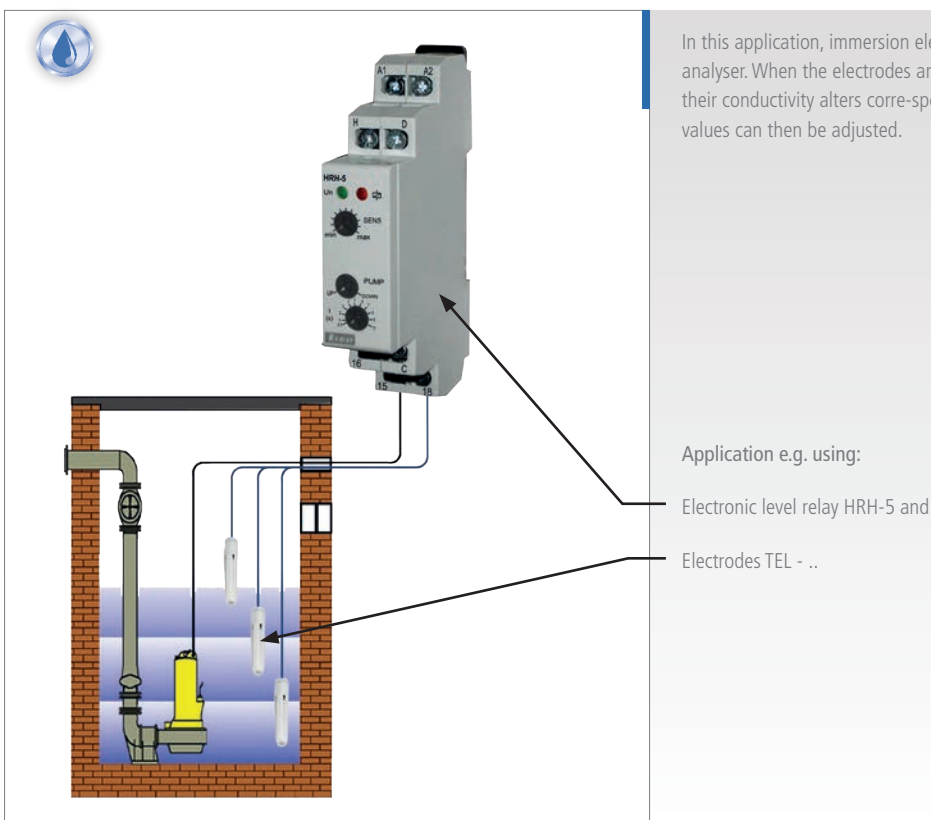
Open systems which function without aeration must achieve a regeneration of pressure within the system - this can be reached by an increase in volume and temporary operation in air replenishment mode. Any air losses in the measurement system will thereby be compensated for which, during the emptying process, causes the level to drop so far at regular intervals that the bell becomes exposed and air can therefore penetrate into the system (air replenishment).

In addition, with the help of a wet bell, the air volume within the measuring system should be increased.

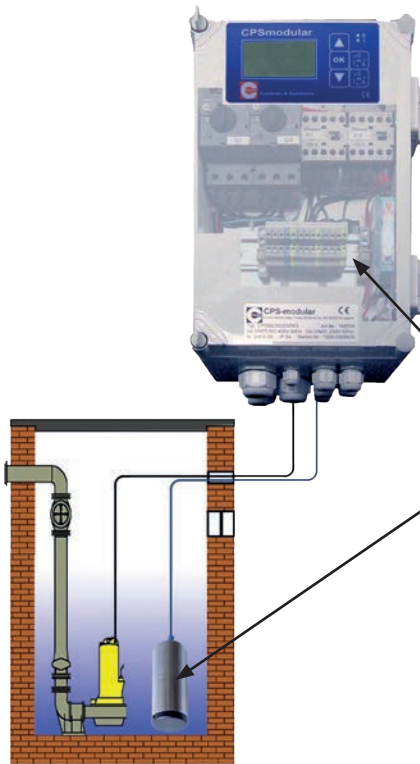
2.2.2 Impact pressure method, open system using bubblers



3. Conductivity measuring method



4. Hydrostatic measurement method



In this application, a level sensor is lowered into the medium within a sealed enclosure, whereby ceramic or piezoresistive sensors are used. The filling level pressure then acts directly on the ceramic or piezoresistive sensor and the subsequent value is then transmitted as a 4-20 mA signal via the connecting lead.

Application e.g. using:

Electronic pump control CPS modular 2 and
Level sensor ENS

Float switches which turns ON or OFF depending on the cable length.

Type Designations

PSN-O

Float switches for emptying. On reaching the upper switching threshold the switching mechanism activates the pump. On reaching the lower switching threshold the pump is switched off. This float switch can also be used as run dry protection.

PSN-F

Float switches for filling. On reaching the lower switching threshold the switching mechanism activates the pump. On reaching the upper switching threshold the pump is switched off.

PSN-X

Float switches for filling and emptying.

PSN-.. + ST

Float switch with plug and socket for pump connection.

PSN-O DB

Float switches for emptying with integrated cable breakage and short-circuit monitoring, with gold flashed contacts.

PSN-X-SP

Float switches for filling and emptying for PLC application and for intrinsically safe circuits, with gold flashed contacts.

Neoprene Insulated Lead

Highly flexible lead acc. to VDE 282 Part 4 resp. HD 22.4 S3 guarantees a long service life.

Protective Conductor Connection acc. to VDE 0631 Part 1 protection class 1 resp. EN 60730-1

A metal shield connected to the protective conductor of the lead ensures additional protection against electrical shock.

Perfect Casing

The inner chamber with the switch mechanism and lead are seamlessly enclosed by isolating polypropylene.

Contact Rating

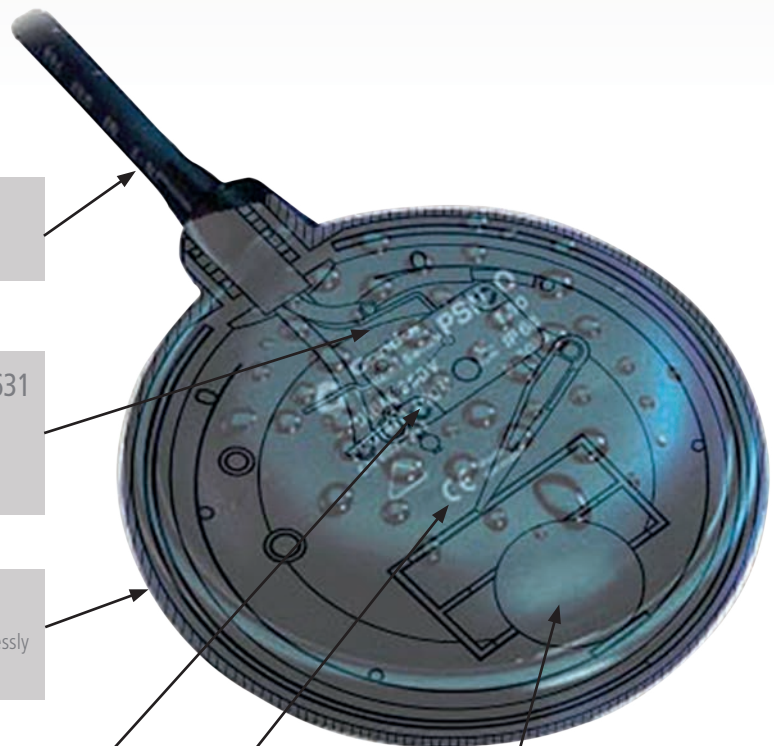
Motors with a switching capacity of up to 1.1 kW (at 250 V~) may be switched directly.

High Quality HR-Foam Floating Body

Physical properties and chemical resistance of the polypropylene body are extraordinarily high, so that damages due to mechanical impact or chemical influence may be ruled out.

KLS Ball Guiding System

The new ball guiding system KLS ensures an even higher switching accuracy within the tolerance range.



Type overview float switches PSN



Float switch PSN- ...

Order reference	Description	Cable length	Weight in g	Part No.
PSN-O 3 m	for emptying	3 m	500	234166
PSN-O 5 m		5 m	650	234173
PSN-O 10 m		10 m	1000	234180
PSN-O 15 m		15 m	1350	234197
PSN-O 20 m		20 m	1700	234203
PSN-O 30 m		30 m	2400	237082
PSN-F 3 m	for filling	3 m	500	234210
PSN-F 5 m		5 m	650	234227
PSN-F 10 m		10 m	1000	234234
PSN-F 15 m		15 m	1350	234241
PSN-F 20 m		20 m	1700	234258
PSN-F 30 m		30 m	2400	258421



Float switch PSN- ...+ ST

Order reference	Description	Cable length	Weight in g	Part No.
PSN-X 3 m	for filling and emptying export-version without protective conductor 1 SPDT	3 m	500	234265
PSN-X 5 m		5 m	650	234272
PSN-X 10 m		10 m	1000	234289
PSN-X 15 m		15 m	1350	234296
PSN-X 20 m		20 m	1700	234302
PSN-X 30 m		30 m	2400	237174
PSN-O + ST 5 m	Float switch with plug and socket for pump connection	5 m	750	234319
PSN-O + ST 10 m		10 m	1100	234326
PSN-F + ST 5 m		5 m	750	234333
PSN-F + ST 10 m		10 m	1100	234340
PSN-O DB 5 m	for emptying with integrated cable breakage and short-circuit monitoring, with gold flashed contacts	5 m	650	234357
PSN-O DB 10 m		10 m	1000	234364
PSN-X SP 5 m	for filling and emptying for PLC application and for intrinsically safe circuits, with gold flashed contacts, export-version without protective conductor, 1 SPDT	5 m	650	234371
PSN-X SP 10 m		10 m	1000	234388
PSN-X SP 15 m		15 m	1350	236092
PSN-X SP 20 m		20 m	1700	236115
PSN-X SP 30 m		30 m	2400	245254
PSN-X SP 40 m		40 m	3100	245261

Accessories for Float switches PSN



Weight BG - PS

Cable support K - PS

Zener barrier

Order reference	Description	Weight in g	Part No.
BG-PS	Weight for float switch, color of body blue (for free setting of the switching differences)	400	236658
IG-PS	Weight for float switch, color of body yellow (for free setting of the switching differences)	180	234401
K-PS	Cable support for float switch PSN, (fixing by means of a standard clip)	5	234418
Zener barrier MTL7778 28 V AC	Zener barrier for use e.g. of float switches in areas that are at risk of explosion	110	283072
Zener barrier MTL7787 28 V DC	Attention: The input voltage of the zener barrier mustn't exceed 28 V (AC / DC).	110	260479

Float switch PSN

Technical Data PSN-O/F/X (ST/SP)			
Rated operational voltage U_e (AC)	PSN-O/F/X	PSN...+ST...	PSN-X SP
	250 V ~ 400 V ~	250 V ~	max. 30 V ~
Rated operational current I_e (AC)	PSN-O/F/X	PSN...+ST...	PSN-X SP
	10(8) A (250 V ~) 10(4) A (400 V ~)	10(8) A	max. 400 mA
Contact rating		1,1 kW	
Max. cycles Cycles 50 E3		≥ 50.000	
Temperature resistance Cable VDE 282 T 4 12/95 Body		60 °C 85 °C	
Temperature resistance gem. VDE			
PSN-O / PSN-F *		10 A – T 45 °C	
PSN-O / PSN-F		8 A – T 50 °C	
PSN-O / PSN-F		6 A – T 60 °C	
PSN-X SP		T 60 °C	
Protection watertight, depth 10 m		IP 68	
Wire cross sections VDE 0631 T 1 01/96		3 x 1 mm ²	
Lead - black		H 07 RN-F	

Technical Data PSN-O DB	
Rated operational voltage U_e	< 30 V-DC
Rated operational current I_e	11 mA (R=2,7k) 2,4 mA (R=12,7k)
Rated switching capacity* Thermal switching capacity	250 V AC, 1 mA 250 V AC, 6 A
Max. cycles Cycles 50 E3	≥ 50.000
Temperature resistance Cable VDE 282 T 4 12/95 Body	60 °C 85 °C
Protection watertight, depth 10 m	IP 68
Wire cross sections VDE 0631 T 1 01/96	3 x 1 mm ²
Lead black	H 07 RN-F

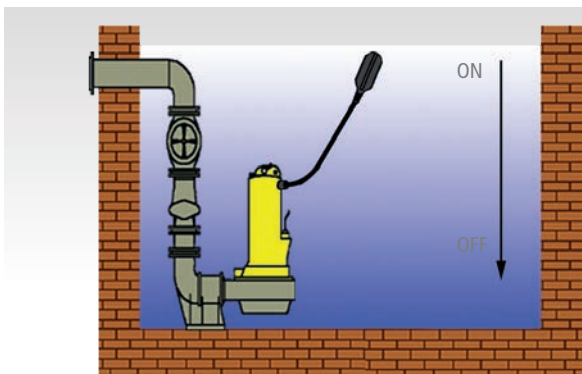
* These models were conceived so that they can be used in circuits with a low switching capacity (min. 1mA / 4V) and with a middle switching capacity (max. 5A).
The respective product may be used only in one of these circuit types during his complete use duration.

Resistance Body / Cable

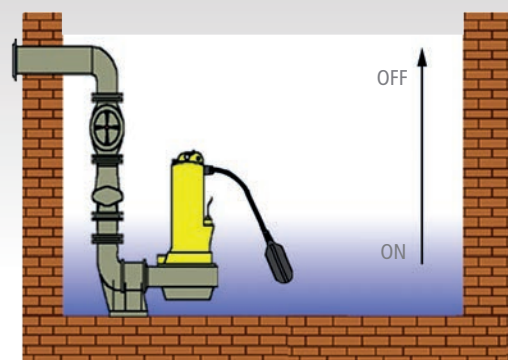
Resistance
Formic acid (hydrous 10%), Gasoline (normal), Diesel, Formaldehyde (hydrous 40%), Glycerine, Fuel oil, Lactic acid (hydrous 10%), Phosphoric acid (hydrous 10%), Nitric acid (hydrous 10%), Sulfuric acid (hydrous 35%), Washing powder

Limited resistance
Acetic acid (hydrous 10%), Nitric acid (hydrous 10%), Chlorinated water, Hydrogen peroxide

Types

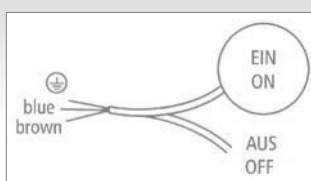


PSN-O Float switch for emptying
Contact closes in upper position and switches the pump on.
PSN-X Float switch for filling and emptying
Export-version with 1 SPDT without protective conductor and VDE-Approval mark.

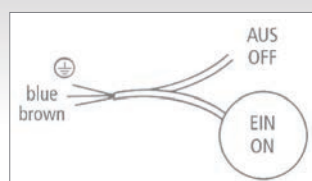


PSN-F Float switch for filling
Contact opens in upper position and switches the pump off.

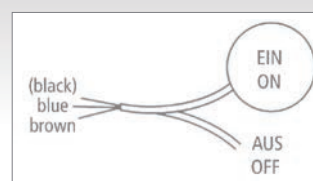
Circuit Diagrams Float switch PSN



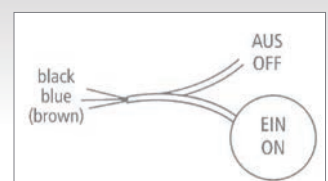
Float switch PSN-O
for emptying



Float switch PSN-F
for filling



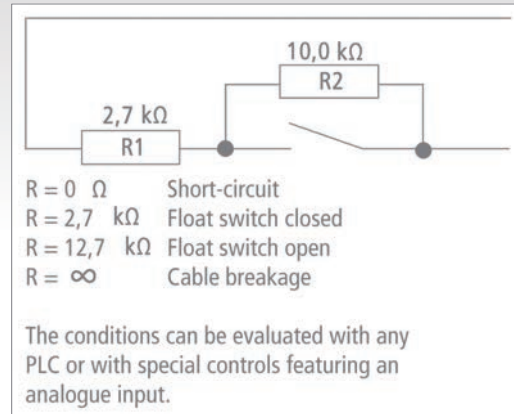
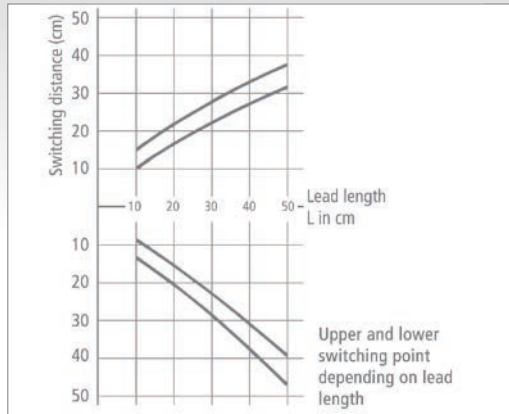
Float switch PSN-X
here in function for emptying



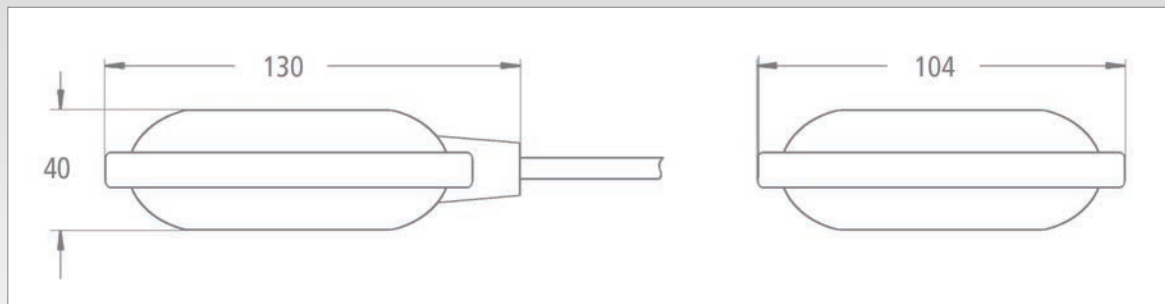
Float switch PSN-X
here in function for filling

Switching Diagram PSN

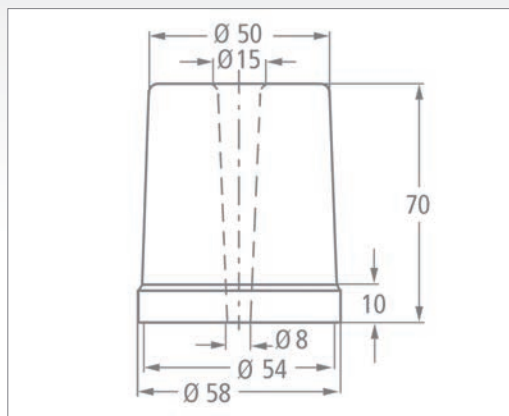
Inner wiring PSN-O DB



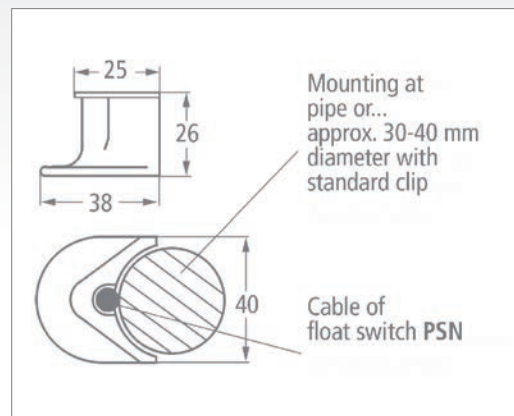
Dimensions PSN / Accessories



Float switch PSN

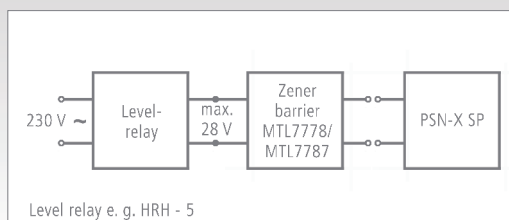


Weight BG-PS / IG-PS



Cable support K-PS

Atex-connecting of the PSN with the zener barrier MTL 7778 / MTL 7787



Technical Data MTL 7778 / MTL 7787	
Max. input voltage U	28 V AC (MTL7778) 28 V DC (MTL7787)
Contact resistance R	600 Ω (MTL7778) 300 Ω (MTL7787)
Operating current	47 mA (MTL7778) 93 mA (MTL7787)

A exceeding the input voltage at the zener barrier leads to the destruction

Electronic pump control ENP



Electronic single/dual pump control with monitoring features

Electronic pump control for filling and emptying a tank with integrated relative pressure transducer for panel board mounting, connection for pneumatic tube, four adjustable switching points, three relay outputs, staging and sequencing control, isolating transformer acc. to VDE 0550.

Function: The device analyses the pressure applied to the sensor.

Two pumps for emptying a tank are connected to terminals 11/14 and 21/24 on alarm can be connected to terminals 31/34.

All levels are adjustable.

The LED's illuminate when the pumps or the alarm are switched on. The relays are activated. The tripping delay for the alarm is fixed, preset value

Order reference	Type Code	Measuring range (m)	Max. inaccuracy at 25°C	Resolution	Operating voltage U_B (V-AC)	max. perm. level	Weight (in g)	Part No.
ENP 2.3 oN		0,1–2 m	2,5 %	0,01 m	230	10 m	295	260486
ENP 2.3		0,1–2 m	2,5 %	0,01 m	230	10 m	295	260493
ENP 4.3		0,1–4 m	2,5 %	0,01 m	230	10 m	295	260509
ENP 10.3		0,1–10 m	2,5 %	0,10 m	230	20 m	295	260516

Accessories: open and closed wet bell

0 V = 0,1m / 10 V = measuring range end value

Accessories ENP

Order reference	Description	Weight (in g)	Part No.
KL-S	Jack 2.5 mm for analogue output connection (cable length 5 m)	15	260332

Technical operating data

Permissible operating voltage range	±10 %
Operating voltage influence at ± 10% operating voltage fluctuation	< 0,1 %
Duty factor ED	100 %
Permissible ambient and media temperature	-20°C up to +60°C
Permissible ambient humidity rel. humidity, non-condensing	10 % up to 90 %
Permissible storage temperature	-40°C up to 80°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 1,5 VA

Pressure connection

Quick connect suitable pneumatic tube e.g.	6 x 1 mm Festo PAN
--	--------------------

Analogue output

Analogue voltage signal max. 5 mA short-circuit proof	0 - 10 V
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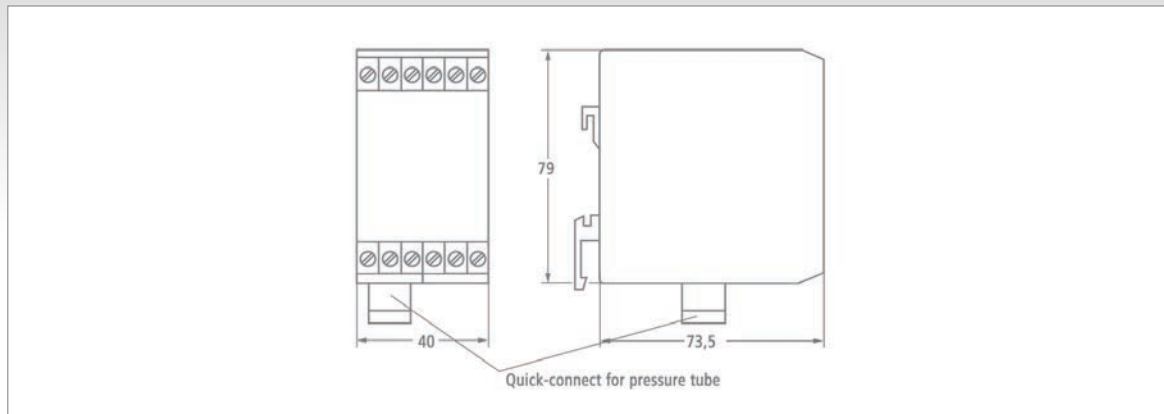
Enclosure

Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure protection	IP 40
Protection against shock	acc. VBG 4
Terminals	Cage clamps
Cross section	2,5 mm ²
Weight	290 g
Male jack plug Jack 2.5 mm	2,5 mm

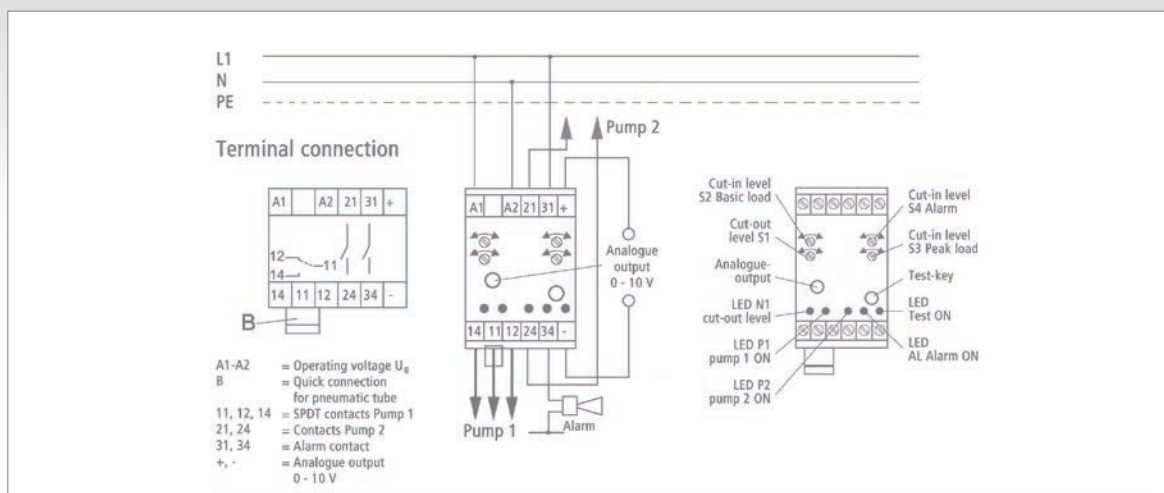
Power section

Series voltage acc. to VDE 0660 and VDE 0110 Group C	250 V-AC
Maximum continuous current per contact	6 A-AC
Maximum switching capacity per contact	1.500 VA (AC) 50 W (DC)
Mechanical life Schaltspiele	approx. 1 x 10 ⁷
Electrical life (max. load) Cycles	approx. 1 x 10 ⁵

Dimensions ENP

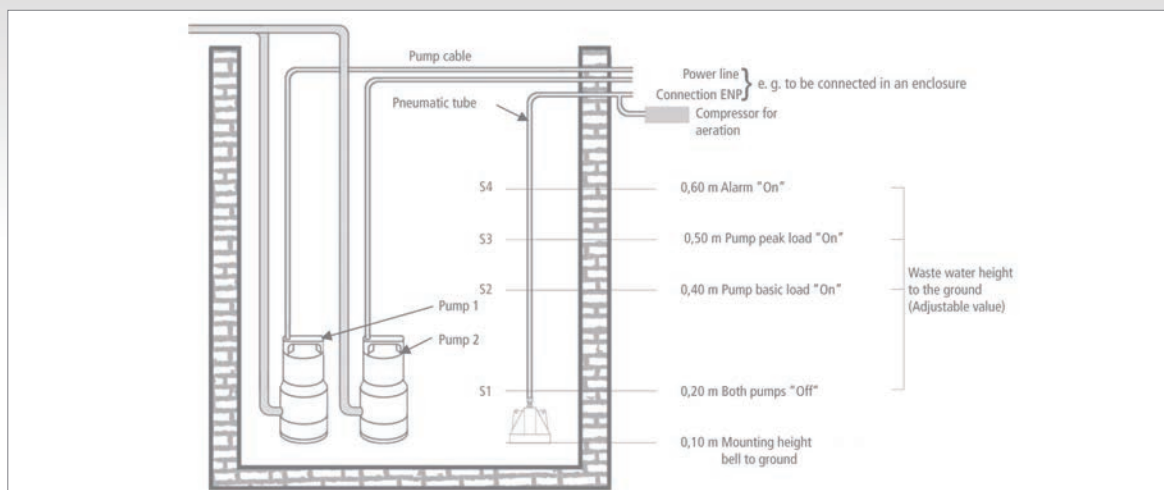


Wiring Diagram ENP



ENP as single or dual-pump control

Wiring diagrams ENP



Electronic level relay ENR



- Electronic level relay for all ranges from 0.1 – 2 m
- For panel board mounting
- Measurement according to impact pressure method
- Relay output
- Output signal: 0 – 10 V

Electronic level relay with integrated relative pressure transformer for panel board mounting, quick-connect for pneumatic tube, two adjustable thresholds, relay output and isolating transformer according to VDE 0550.

Function: The device evaluates the pressure applied to the sensor. Should a pump for emptying a tank be connected to terminals 11 and 12, then the pump is switched on when the upper threshold is exceeded. The pump is switched off when falling below the lower threshold. Both thresholds are adjustable. The LED illuminates when the pump is running, whereby the relay is deactivated.

Order reference	Type Code	Measuring range (m)	Max. inaccuracy at 25°C	Resolution	Operating voltage U_B (V-AC)	max. perm. level	Weight (in g)	Part No.
ENR 2		0,1–2 m	2,5 %	0,01 m	230	10 m	100	260523

Accessories: open and closed wet bell

0 V = 0,1m / 10 V = measuring range end value

Accessories ENR

Order reference	Description	Weight (in g)	Part No.
KL-S	Jack 2.5 mm for analogue output connection (cable length 5 m)	15	260332

Technical operating data	
Permissible operating voltage range	±10 %
Operating voltage influence at ± 10% operating voltage fluctuation	< 0,1 %
Duty factor ED	100 %
Permissible ambient and media temperature	-20°C up to +60°C
Permissible ambient humidity rel. humidity, non-condensing	10 % up to 90 %
Permissible storage temperature	-40°C up to 80°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 1 VA

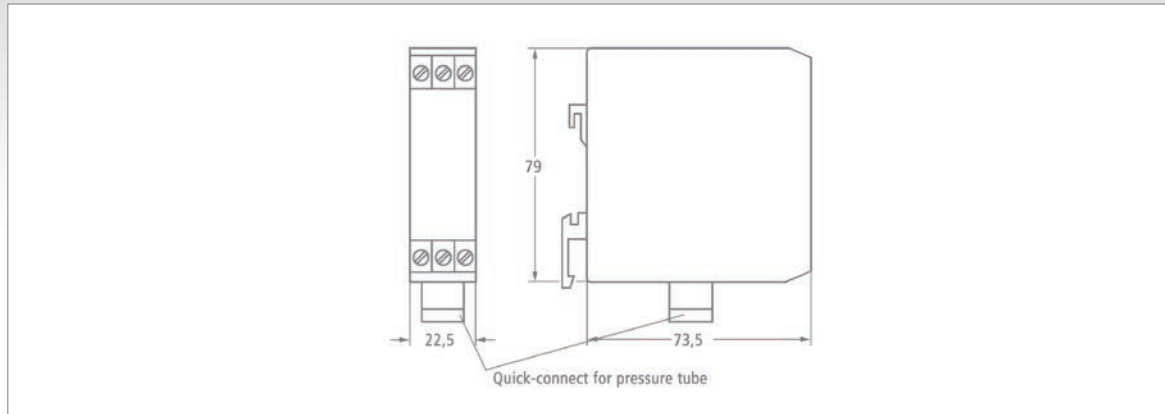
Pressure connection	
Quick connect suitable pneumatic tube e.g.	6 x 1 mm Festo PAN

Analogue output	
Analogue voltage signal max. 5 mA short-circuit proof	0 - 10 V

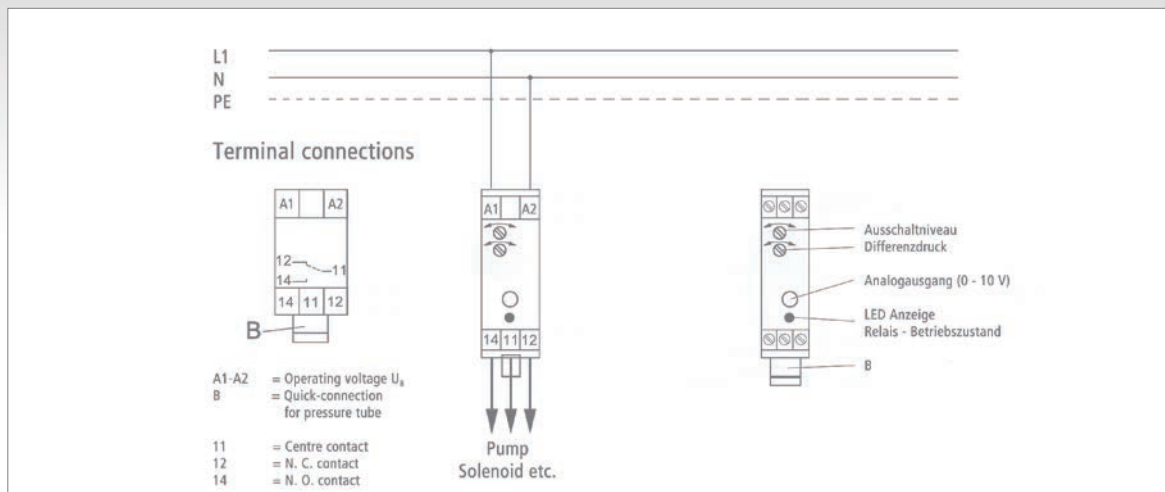
Enclosure	
Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure protection	IP 40
Protection against shock	acc. VBG 4
Terminals	Cage clamps
Cross section	2,5 mm ²
Weight	290 g
Male jack plug Jack 2.5 mm	2,5 mm

Power section	
Series voltage acc. to VDE 0660 and VDE 0110 Group C	250 V-AC
Maximum continuous current per contact	6 A-AC
Maximum switching capacity per contact	1.500 VA (AC) 50 W (DC)
Mechanical life Schaltspiele	approx. 1 x 10 ⁷
Electrical life (max. load) Cycles	approx. 1 x 10 ⁵

Dimensions ENR



Wiring Diagram ENR



Electronic level relay HRH-5

Electronic level relay HRH-5



Level relay for level monitoring, using 2 or 3 electrodes
1 SPDT

Standard relay for level monitoring with 1 and 2 threshold values, infinitely variable limit values, 1 SPDT and isolating transformer according to VDE 0550.

Function: The electrodes are connected to the relay. Should the tank be made of a conductive material, it can be used as a third electrode (For connection see wiring diagram).

AC current is used in order to avoid polarisation, electrolysis and undesired oxidation of the electrodes.

To minimize false relay switching (e.g. pollution of the probes, humidity ...), the switching sensitivity can be adjusted to the conductivity of the respective media.

Ordering reference	Type Code	adjustable hysteresis (kΩ)	Time reaction	Adjustable delay time	Operating voltage (V-AC / DC)	Weight (in g)	Part No.
ENR 2 HRH-5		5 - 100 kΩ	< 400 ms	0,5 - 10 s	24...240 V-AC / DC	92	250203

Accessories, electrodes for HRH-5



Ordering reference	Description	Applica- tion	Part No.
TEL-00	Single electrode with screw version		236467
TEL-05	Single electrode, 5m cabel H07 RN-F 1x1,5 mm ²		260684
TEL-10	Single electrode, 10 m cabel H07 RN-F 1x1,5 mm ²		260691
TEL-20	Single electrode, 20 m cabel H07 RN-F 1x1,5 mm ²		260707
TEL-TW-05	Single electrode, 5 m cabel TML-B 1x1,5 mm ² Waquasan Reg. Nr. 11156/09564	Suitable for use with potable water. Temperature range 0 ... 90°C	260714
TEL-TW-10	Single electrode, 10 m cabel TML-B 1x1,5 mm ² Waquasan Reg. Nr. 11156/09564		260721
TEL-TW-20	Single electrode, 20 m cabel TML-B 1x1,5 mm ² Waquasan Reg. Nr. 11156/09564		260738

Technical operating data	
Permissible operating voltage range	-15 % +10 %
Operating voltage influence at ± 10% operating voltage fluctuation	< 0,1 %
Duty factor ED	100 %
Permissible ambient temperature	-20°C bis 55°C

Technical operating data	
Permissible storing temperature	- 30°C bis 70°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 2,0 VA

Electronic level relay HRH-5

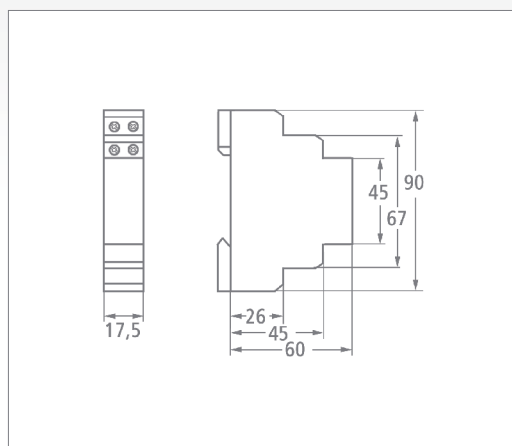
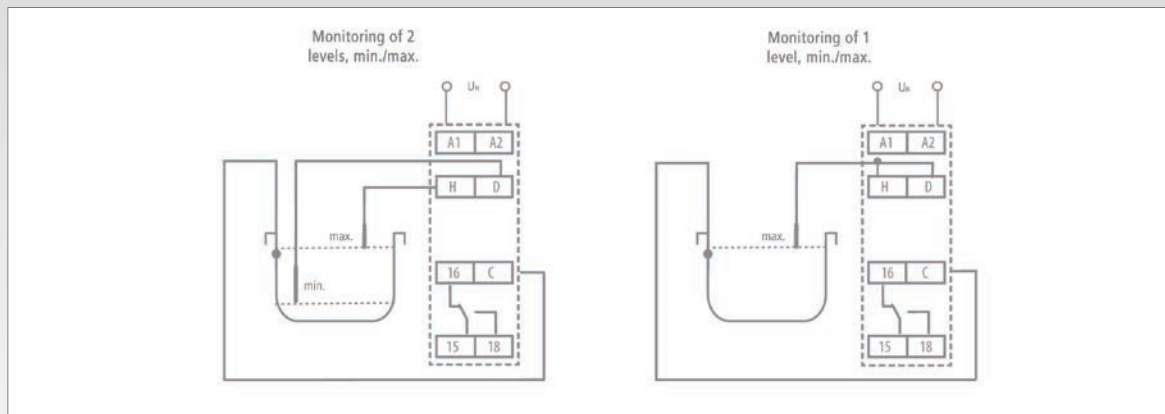
Enclosure	
Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Degree of Protection	IP 40
Shock protection	acc. to VBG 4
Connection Box	Box-type terminals
Max. cross-section with cable end sleeves	max, 1 x 4, 2 x 2,5 mm ² max, 1 x 2,5, 2 x 1,5 mm ²

Dipped electrodes TEL	
Electrode and screw	stainless steel (1.4301 or higher)
plastic coat	polyethylene
seal	brass
Cable optional	1-conductor cable, for example Rubber Cable H07 RN-F

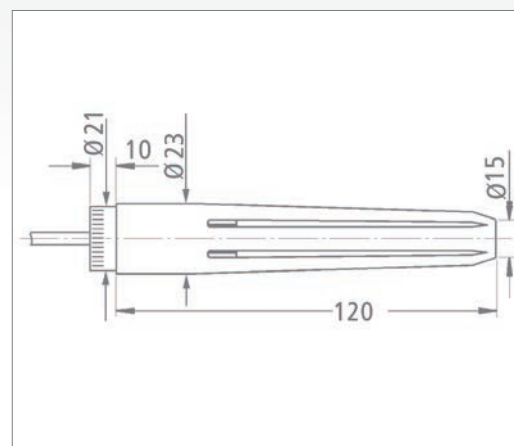
Output contacts	
Series voltage acc. to VDE 0660 and VDE 0110 Group C	24...240 V-AC/DC
Maximum continuous current per contact	8 A AC1
max. switching capacity (240V AC1/ 24 V DC) min. switching capacity (24 V DC)	2.500 VA, 240 W 500 mW
Mechanical life Cycles	approx. 1 x 10 ⁷
Electrical life (max load) Cycles	approx. 1 x 10 ⁵
Weight	72 g

Dipped electrodes TEL-TW (suitable for drinking water)		
Electrode and screw	stainless steel 1.4305	
plastic coat	ISO-LEN® 1000	Food law-tion statement from the manufacturer
seal	NBR	KTW and DVGW W 270
Cable optional	FACAB DRINCABLE + 07 KTW-W270-acs 1x1,5 mm ² ARISTONCAVI 2010	KTW and DVGW W 270

Wiring Diagram HRH-5 (Sample with a conducting tank)



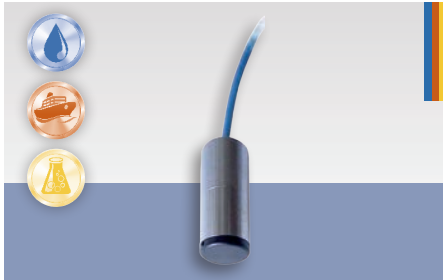
Electronic level relay HRH-5



Electrode TEL-05-..

Stainless steel level sensor ENS

Stainless steel level sensor ENS



With ceramic measuring cell, shielded cable and a specially designed stainless steel enclosure, Condor offers a precision level sensor for all different types of applications, like e.g. wastewater. The sensor offers extremely high media resistance and the especially large membrane makes the sensor insensitive to pollution.

The ENS level sensor is also available with ATEX (explosive atmosphere) approval.

The shielded cable protects the output signal (4 – 20 mA) against electromechanical influences.

Order reference	Type Code	Measuring range	Cable length	EX Approval	Weight (in g)	Part No.
ENS 1/10		bis 1,0 m	10 m		1000	245414
ENS 4/10		bis 4,0 m	10 m		1000	290193
ENS 10/15		bis 10,0 m	15 m		1250	290049
ENS 1/10 EX		bis 1,0 m	10 m	X	1000	245421
ENS 1/15 EX		bis 1,0 m	15 m	X	1250	245438
ENS 1/20 EX		bis 1,0 m	20 m	X	1500	290025
ENS 1/25 EX		bis 1,0 m	25 m	X	1750	245445
ENS 1/30 EX		bis 1,0 m	30 m	X	2000	245452
ENS 4/10 EX		bis 4,0 m	10 m	X	1000	242673
ENS 4/15 EX		bis 4,0 m	15 m	X	1250	242680
ENS 4/20 EX		bis 4,0 m	20 m	X	1500	290209
ENS 4/25 EX		bis 4,0 m	25 m	X	1750	290216
ENS 4/30 EX		bis 4,0 m	30 m	X	2000	290230
ENS 4/40 EX		bis 4,0 m	40 m	X	2500	290247
ENS 10/10 EX		bis 10,0 m	10 m	X	1000	242703
ENS 10/15 EX		bis 10,0 m	15 m	X	1250	242697

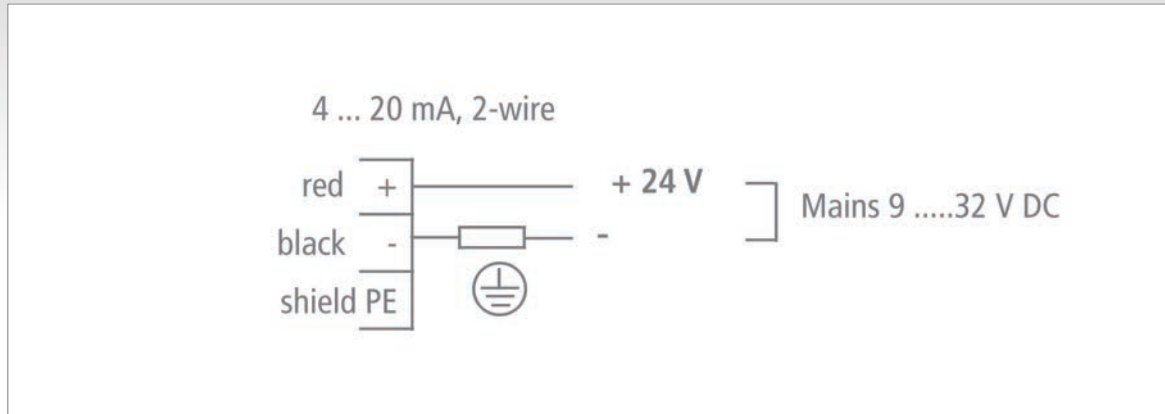
Accessories ENS

Description	Weight (in g)	Part No.
Galvanized fixing clamp for level sensor	165	290223
Stainless steel fixing clamp for level sensor	170	282396
Protective cap for level sensor as replacement	12	282372
Terminal box ENS - to extend the connection line of electronic immersion sensors -	30 g	282389

Technical operating data	
Measuring range	0 – 25 mbar up to 0 – 60 bar
Output signal	4 – 20 mA, 2-wire
Accuracy	< 0,2 % v. M.E.
Adjustment time	200 ms (other values on demand)
Auxiliary voltage	9...32 V DC, max. 30 mA (12...30 V for EX-type)
Temperature range	-25...80 °C (-25...70 °C for EX-type)

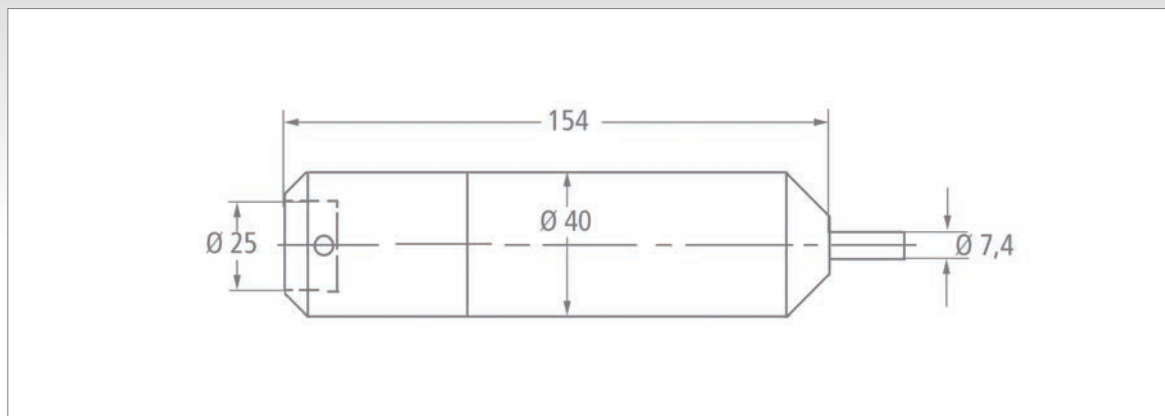
Technical operating data	
Temperature influence	< 0,015 %/K of measuring range
Housing	Stainless steel, 1.4571
Degree of Protection	IP 68
Electrical connection	Kevlar braided PE cable, wire cross-section 0,34 mm², with pressure compensation
EX-protection	EEx ia IIC T6

Wiring diagram ENS



Level Sensor ENS

Dimensions ENS



Level Sensor ENS

Application example:



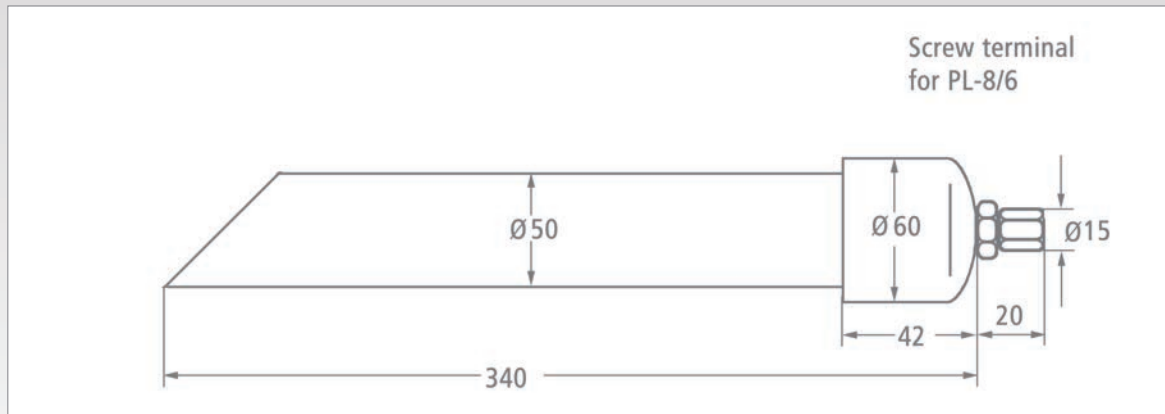
Level sensor ENS
Monitors e.g. Wastewater/Water level in a pump shaft

Bells and Accessories for Level Monitoring

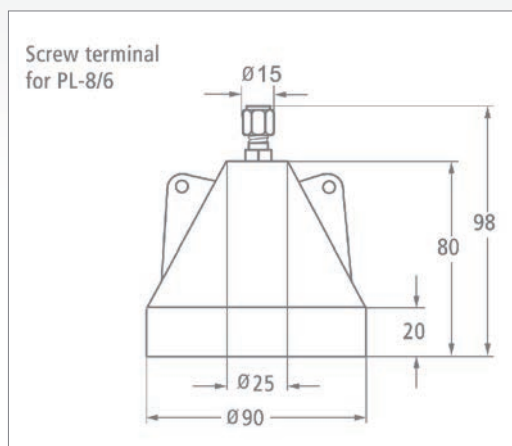


Order reference	Description	Weight (in g)	Part No.
	Wet bells		
OGL-8	Open wet bell with screw connection for PL-8/6	250	260530
OGL Installation kit	Installation kit for OGL-8, stainless steel, screw tube clamp and Stockschrabe	150	282198
OGL-8 GU	Open wet bell (gray cast iron with stainless steel chain) with screw connection for PL-8/6, chain length 2,9 m	1100	290117
	Pneumatic tube (PL) PL-8/6 – 8 mm outer-ø, 6 mm inner-ø PL-6/4 – 6 mm outer-ø, 4 mm inner-ø		
PL-8/6, 10 m	10m rope PL-8/6	225	260554
PL-8/6, 20 m	20m rope PL-8/6	450	260561
PL-8/6, 1 m	Length > 20 m, each m (max. length per rope 100 m)	23	260578
PL-6/4, 1 m	Pneumatic tube PL-6 (price / m)	20	260585
	Screw connections		
Screw connection 1/8"	Screw connection 1/8" for OGL-8 GU / GGL-8	20	260592
R-SCH	Reducing screw connector for PL from PL-8/6 to PL-6/4	22	260615
T-ST 6	T-plug connector für PL-6/4 for aeration	11	260622
T-SCH 8	T-screw connector for PL-8/6 for aeration	14	260639
	Small compressors		
Rena-Air 100	for aeration, incl. check and security valve with T-screw connector for PL-8/6 (120 L/h; 150 mb; 3W; 230 V AC IP X4), e.g. usable with open wet bells	315	260646
Rena-Air 100 in casing	for aeration, incl. check and security valve with T-screw connector for PL-8/6 (120 L/h; 150 mb; 3W; 230 V AC IP X4), e.g. usable with open wet bells	720	260653

Bell Dimensions



Bell OGL



Bell OGL - GU

Basis pump control CPSB



CPS B1



CPS B2

Compact pump control for one or two pumps with a rated current up to max. 9A / 400V AC per pump:

- Small dimensions, ideal for mounting into narrow exterior panels
- High quality basic equipment in standard execution (main circuit-breaker, manual motor starter, Manual-0-Auto sensor buttons, LED displays for operating conditions of the pumps, external serial PC-interface, display illuminated, extensive functionality and adjustability.
- Suitable for the operation of pumps and sensors in explosive areas (ATEX) as the pump control always comprises the necessary manual motor starter in accordance with DIN EN 60079-14, DIN VDE 0660 and EN 60947.
- Free installation areas e.g. for two Zener barriers, which are needed for an intrinsically safe circuit with possible level sensors or float switches.

Order reference	Type Code	Number of pumps	Adjustable range for motor rated current	Weight (in g)	Part No.
CPSB1 / 1,0-1,6 A		1	1,0 – 1,6 A	2660	280002
CPSB1 / 1,6-2,5 A		1	1,6 – 2,5 A	2660	280019
CPSB1 / 2,5-4,0 A		1	2,5 – 4,0 A	2660	280026
CPSB1 / 4,0-6,3 A		1	4,0 – 6,3 A	2660	280033
CPSB1 / 6,3-9,0 A		1	6,3 – 9,0 A	2660	280040
CPSB2 / 1,0-1,6 A		2	1,0 – 1,6 A	3220	280057
CPSB2 / 1,6-2,5 A		2	1,6 – 2,5 A	3220	280064
CPSB2 / 2,5-4,0 A		2	2,5 – 4,0 A	3220	280071
CPSB2 / 4,0-6,3 A		2	4,0 – 6,3 A	3220	280088
CPSB2 / 6,3-9,0 A		2	6,3 – 9,0 A	3220	280095

Accessories CPS-B

Order reference	Description	Weight (in g)	Part No.
CPSB Pressure transducer	Measuring range 0-2 m; with tube and screw terminals	24	280101
CPSB Package	Additional 4 cable glands M16	40	280118
CPSB price 230V	For the use of 230V / AC pumps	-	280125
CPSB Alarm system	Battery 12V 1,2Ah + cable set for buffering at power failure	554	280132
CPSB Partition plate Zenerb.	Necessary for the use of a Zener barrier in a CPSB2	18	280149
Zenerbarriere	Necessary for an intrinsically safe circuit in explosive areas (ATEX)	124	260479
CPSB	Mounting bracket for casing For a four-point wall attachment	10	282587

Technical Data CPSB

Operating voltage / supply line	400V 50Hz; 3L/N/PE
Degree of protection	IP54
Protection class	ⓘ
Temperature range	0 ... +50°C
Control voltage	230V AC / 12V DC
Dimensions	B265xH270xT145mm

Options (on request)

- installation in exterior columns
+ panel heater, + flashing light, + small compressor
- separate casing for PTC relays, FI, etc.

Additional data are available on our homepage: www.condor-cpc.com

Pump control CPS-L

... for price sensitive applications



Pump control CPS-L

For many price sensitive applications with limited available space, cost-effective but powerful pump controls are needed.

Condor's new pump control CPS-L handily fulfills these requirements. The CPS-L pump control is designed for the automatic control of one pump (max. 4 KW / 9A).

With its compact design, but with no essential concessions in terms of functions, this pump control can be ideally used for

pumping systems in the field of domestic waste and sewage water as well as rain water.

Advantages

- Compact housing (w200xh220xd140mm, incl. accessories). The CPS-L can be nearly used too broad
- Extensive basic equipment includes membrane keypad for operation / programming, LED displays for pump condition, illuminated display and extensive functionality / adjustability (see detailed description).
- Suitable for the control of pumps and sensors in explosive areas (ATEX) in accordance with DIN EN 60079-14, DIN VDE 0660 and EN 60947 (relay for manual motor starters is optional).
- Option available for serial PC-interface and software "WaterTel".

NEW!



Technical details

Adjustable control parameter

- Alarm level
- ATEX-mode
- Date / time
- Phase sequence monitoring
- Turn on delay
- On / off switch levels
- Failure display
- Short start against pump sticking
- Max. operating time
- Follow-up time
- Switching function of the potential-free alarm relay
- Language (G, E, F, I...)
- Maintenance display
- Cyclical emptying

Options

- 2 x 9 V battery (power failure alarm)
- 230V (2,3 kW/9A) operating voltage is available
- MCB optional
- Overload relay (BI-metal) can be added
- Cylinder lock for the cover
- Pressure sensor (measuring range 0-2 meters w.c.) can be added

Operation and Display

- Display 2x16 illuminated symbols
- Menu with membrane keypad
- Manual-OFF-Automatic – mode selection
- LED display for pump status
- LED display for pump readiness
- Both buzzer and LED alarm indication
- Open cover interlock
- Detailed menu with all relevant setting options
- Maintenance display
- ATEX-mode
- Phase sequence monitoring
- Display of operating hours and switching cycles

Available connections

- Thermal contact (zero voltage safe)
- 1 X 230V / 1A output for possibly small compressor
- Potential-free alarm relay
- NC aux-contact

Level monitoring

- 1 or 2 float switches
- Impact pressure method (optional: plug-on modul)
- 4-20 mA analog input e.g. for level sensor
- Separate high water float switch

Technical data CPS-L	
Housing	ABS
Dimensions	w 200 x h 220 x d 140 mm, incl. accessories
Cable glands	2 x M25 x 1,5 3 x M16 x 1,5 1 x M12 x 1,5
Protection class	IP54
Max. protection on site	16A
Max. power of the pump	4KW
Number of pumps	1 pump
Control voltage	230V AC

Technical data CPS-L	
Operating voltage / supply line	3x 400V 50 Hz (L1, L2, L3, N, PE)
Temperature range	0...+50°C
Potential-free alarm contact	5A (2A inductive)
Rated current	1,0 bis 1,6A 1,6 bis 2,5 A 2,5 bis 4,0 A 4,0 bis 6,0 A 5,5 bis 8,0 A 7,0 bis 9,0 A

Modular pump control CPS-M



Modular pump control for one or two pumps up to 75 kW per pump:

- High quality basic equipment in standard execution
- Alternatively with or without main circuit-breaker
- Suitable for the operation of pumps and sensors in explosive areas (ATEX) as the pump control always comprises the necessary manual motor starter in accordance with DIN EN 60079-14, DIN VDE 0660 and EN 60947
- Variable enclosure concepts
- Customized solutions
- If desired, completely assembled and wired in an outer enclosure
- Different pump start-up phases:
 - Direct starting
 - Star / delta starting
 - Soft starting
 - Frequency drive
- Telecontrol system with GSM-modem

Type overview CPS-M with direct starting

Standard version without main circuit-breaker; can be ordered separately according to the motor rated current.

Order reference	Type Code	Number of pumps	Adjustable range for motor rated current	Enclosure	Main circuit-breaker to be ordered sep.	Part No.
CPSM1/5D/23/016		1	1,0 – 1,6 A	Plastic / BxHxT 200x300x140mm	25A	280156
CP-M1/5D/23/025		1	1,6 – 2,5 A	Plastic / BxHxT 200x300x140mm	25A	280163
CPSM1/5D/23/040		1	2,5 – 4,0 A	Plastic / BxHxT 200x300x140mm	25A	280170
CPSM1/5D/23/063		1	4,0 – 6,3 A	Plastic / BxHxT 200x300x140mm	25A	280187
CPSM1/5D/24/100		1	6,3 – 10,0 A	Plastic / BxHxT 200x400x140mm	25A	280194
CPSM1/5D/24/160		1	11,0 – 16,0 A	Plastic / BxHxT 200x400x140mm	25A	280200
CPSM2/5D/24/016		2	1,0 – 1,6 A	Plastic / BxHxT 200x400x140mm	25A	280217
CPSM2/5D/24/025		2	1,6 – 2,5 A	Plastic / BxHxT 200x400x140mm	25A	280224
CPSM2/5D/24/040		2	2,5 – 4,0 A	Plastic / BxHxT 200x400x140mm	25A	280231
CPSM2/5D/24/063		2	4,0 – 6,3 A	Plastic / BxHxT 200x400x140mm	25A	280248
CPSM2/5D/24/100		2	6,3 – 10,0 A	Plastic / BxHxT 200x400x140mm	32A	280255
CPSM2/5D/24/160		2	11,0 – 16,0 A	Plastic / BxHxT 200x400x140mm	63A	280262

Type overview CPS-M with star / delta starter

ATo be delivered only with main circuit breaker which has to be ordered separately according to the motor rated current.

Order reference	Type Code	Number of pumps	Adjustable range for motor rated current	Enclosure	Main circuit-breaker to be ordered sep.	Part No.
CPSM1/SD/34/100		1	6,3 – 10,0 A	Plastic / BxHxT 300x400x140mm	25A	280279
CPSM1/SD/34/160		1	10,0 – 16,0 A	Plastic / BxHxT 300x400x140mm	25A	280286
CPSM1/SD/34/200		1	14,0 – 20,0 A	Plastic / BxHxT 300x400x140mm	32A	280293
CPSM1/SD/34/250		1	19,0 – 25,0 A	Plastic / BxHxT 300x400x140mm	63A	280309
CPSM1/SD/34/320		1	24,0 – 32,0 A	Plastic / BxHxT 300x400x185mm	63A	280316
CPSM2/SD/64/100		2	6,3 – 10,0 A	Plastic / BxHxT 600x400x140mm	25A	280330
CPSM2/SD/64/160		2	10,0 – 16,0 A	Plastic / BxHxT 600x400x140mm	63A	280347
CPSM2/SD/64/200		2	14,0 – 20,0 A	Plastic / BxHxT 600x400x140mm	63A	280354
CPSM2/SD/64/250		2	19,0 – 25,0 A	Plastic / BxHxT 600x400x140mm	80A	280361
CPSM2/SD/66/320		2	24,0 – 32,0 A	Metal / BxHxT 600x600x200mm	100A	280378

Type overview CPS-M with soft starter

To be delivered only with main circuit breaker which has to be ordered separately according to the motor rated current.

Order reference	Type Code	Number of pumps	Adjustable range for motor rated current	Enclosure	Main circuit-breaker to be ordered sep.	Part No.
CPSM1/SA34/063		1	4,0 – 6,3 A	Plastic / BxHxT 300x400x140mm	25A	280392
CPSM1/SA34/100		1	6,3 – 10,0 A	Plastic / BxHxT 300x400x140mm	25A	280408
CPSM1/SA34/160		1	11,0 – 16,0 A	Plastic / BxHxT 300x400x140mm	25A	280415
CPSM1/SA34/200		1	14,0 – 20,0 A	Plastic / BxHxT 300x400x140mm	32A	280422
CPSM1/SA64/250		1	19,0 – 25,0 A	Metal / BxHxT 600x400x250mm	63A	280439
CPSM1/SA64/320		1	24,0 – 32,0 A	Metal / BxHxT 600x400x250mm	63A	280446
CPSM1/SA66/400		1	28,0 – 40,0 A	Metal / BxHxT 600x600x200mm	80A	280453
CPSM1/SA66/500		1	35,0 – 50,0 A	Metal / BxHxT 600x600x200mm	100A	280460
CPSM2/SA64/063		2	4,0 – 6,3 A	Plastic / BxHxT 600x400x140mm	25A	280484
CPSM2/SA64/100		2	6,3 – 10,0 A	Plastic / BxHxT 600x400x140mm	32A	280491
CPSM2/SA64/160		2	11,0 – 16,0 A	Plastic / BxHxT 600x400x140mm	63A	280507
CPSM2/SA64/200		2	14,0 – 20,0 A	Plastic / BxHxT 600x400x140mm	80A	280514
CPSM2/SA66/250		2	19,0 – 25,0 A	Metal / BxHxT 600x600x200mm	100A	280521
CPSM2/SA66/320		2	24,0 – 32,0 A	Metal / BxHxT 600x600x200mm	125A	280538
CPSM2/SA66/400		2	28,0 – 40,0 A	Metal / BxHxT 600x600x200mm	160A	280545
CPSM2/SA66/500		2	35,0 – 50,0 A	Metall / BxHxT 600x600x200mm	210A	280552

Accessories CPSM

Order reference	Description	Weight (in g)	Part No.
MCB 3pol. 25A / 7,5 Kw	Compl. assembled and wired; Attention: Total electrical power to be considered!	200	280798
MCB 3pol. 63A / 18,5 Kw	Compl. assembled and wired; Attention: Total electrical power to be considered!	283	280811
MCB 3pol. 80A / 22 Kw	Compl. assembled and wired; Attention: Total electrical power to be considered!	700	280835
MCB 3pol. 100A / 30 Kw	Compl. assembled and wired; Attention: Total electrical power to be considered!	463	280842
CPSM Alarm system	Battery 12V 1,2Ah for buffering at power failure	557	280897
Zener barrier	Necessary for an intrinsically safe circuit in explosive areas (ATEX)	123	260479
Service technicians	Technical service per hour		280781

On request we are glad to offer all accessories for the CPSM control!

Technical Data CPSM

Operating voltage / supply line	400V 50Hz; 3L/N/PE
Degree of protection	IP54
Protection class	II
Temperature range	0 ... +50°C
Control voltage	230V AC / 12V DC



Options (assembled and wired according to the need of the customer)

- Main circuit-breaker
- Zener barrier / Isolating switch for ATEX
- Manual-0-Auto switch
- Different signal lamps
- Input terminals with different diameters
- Internal cabinet heater or ventilator
- Phase drop relay with undervoltage control
- PTC-Relay
- Analog output 4-20mA
- Leak testing for pumps
- Residual current devices

Options (assembled and wired according to the need of the customer)

- Analog voltmeter / amperemeter
- Analog hour meter
- Control transformer for other input voltage
- Telecontrol system with GSM-Modem
- Assembled in external enclosures
- Alarm devices (warning lamp, horn)
- Separate 400V / AC outputs
- Separate compressor controls
- Schuko-/CEE- power outlets
- Emergency voltage supply
- Small compressor for aeration

Additional data are available on our homepage: www.condor-cpc.com

Equipment features CPS-L/ CPS-B / CPS-M & CPS-M PLUS

Connection Systems	CPS-L NEW!	CPS-B	CPS-M	CPS-M PLUS NEW!
Number of Pumps	1	1 / 2	1 / 2	3 / 4
Number of inputs for thermo contact monitoring per pump	1 per pump	1 per pump	2 per pump	2 per pump
230V / AC output e.g. for heater or small compressor	•	•	○	•
Number of potential-free alarm relays	1 x	3 x 1 pump 3 x 2 pump	3 x 1 pump 3 x 2 pump	3 x 1-2 pump/ 6 x 3-4 pump
Float switch terminal for emergency operation function	-	•	-	-
Modular terminals for main supply	-	•	•	•
Modular terminals for pump connection	-	-	•	•
Possible level monitoring	CPS-L	CPS-B	CPS-M	CPS-M PLUS
1 float switch	•	•	•	1-2 pump
2 float switches	•	•	•	1-2 pump
3 float switches	-	•	•	1-2 pump
Separate high water float switch (positive pump actuation)	•	•	•	•
4-20mA analog input	•	•	•	•
Impact pressure method 0-2 m	○	○	•	○
Pressure switch connection	-	-	-	-
Adjustable control parameters	CPS-L	CPS-B	CPS-M	CPS-M PLUS
Minimum pressure monitoring	•	•	•	•
On / off switch levels	•	•	•	•
High water level / alarm level	•	•	•	•
Pump follow-up time	•	•	•	•
Load changeover time for pumps	-	•	•	•
Max. pump operating time	•	•	•	•
Delay time between pump 1 and pump 2	-	•	•	•
Current measurement per pump	-	•	•	○
Turn on delay Einschaltverzögerung der Steuerung	•	•	•	•
Short pump start against locking	•	•	•	•
Periodic emptying	•	•	•	•
Delay time high water	•	•	•	•
Language selection	D / GB / NL / F / I	D / GB / NL / F / I	D / GB / NL / F / I	D / GB / NL / F / I
Date / time adjustable	•	•	•	•
Maintenance display	•	•	•	•
Compressor or agitator activation	-	•	•	•
Integrated time switch for compressor function	-	•	•	•
Phase drop monitoring (Ue=0V)	-	-	•	•
Phase sequence detection	•	-	•	•
Integrated buzzer (disconnectable)	•	•	•	•
Alarm relay, programmable function	-	•	•	•
Monitoring of the current limit value of the pump	-	•	•	○
Password protection	•	•	•	•
Operation and indication	CPS-L	CPSB	CPSM	CPS-M PLUS
Display 2x16 illuminated signs Display	•	•	•	-
Graphics display	-	○	○	•
Plain text display	•	•	•	•
Prompt menu with sensor module	-	•	-	-
Prompt menu with 3 keys	4 push-buttons	-	•	•
Hand-O-Automatic sensor keys for mode selection of the pumps	-	•	-	-
Hand-O-Automatic membrane keys	-	-	○	-
LED display for idle state	•	•	•	•
LED display for operating pump status	-	•	○	-
Operational fault LED display / buzzer	•	•	•	•
H-O-A (manual mode - off- automatic mode) function by menu operation	•	-	•	•
From outside operable manual motor starter	○	•	-	-
Transparent cover (lockable version available)	-	•	-	-
Cover locks in the open status	•	•	-	-
Motor current measurement and monitoring	-	•	•	•
Display operating hours and switching cycles	•	•	•	•
Error list	•(20)	•	•	•(100)
Key lock	-	•	•	•
Operating and connection instructions	-	•	-	-

○ Standard / • Option / - Not available

*CPS-L: available from April 2015

*CPS-M PLUS: expected to be available from the end of 2015

NEW!

Modular CPS-M PLUS

For up to 4 pumps (around the end of 2015)



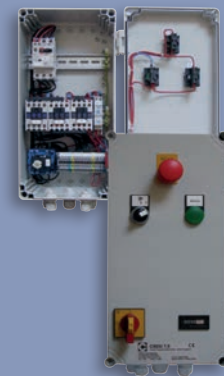
Waste water management

Small sewage treatment plants

Pumping stations

Pressure increase

Level measurement



Motor Technology

Industries



OKE2	Manual motor starters with push-button 3-pole operation Thermal trip Setting range 1.0 – 25.0 A; 500 V AC Switching capacity 11 kW Switching operations 60/h	P. 123	Motor Technology, cost-saving device for standard tasks; separate auxiliary switch is available!
MKE2	Manual motor starters with push-button 3-pole operation Thermal/magnetic trip Setting range 1.0 – 25.0 A; 500 V AC Switching capacity 11 kW Switching operations 60/h	P. 123	Motor Technology, works with high short-circuit currents; separate auxiliary switch is available!
TFE2	Manual motor starters with push-button 2-pole operating Thermal/magnetic trip Thermal contact Operating range 0.40 – 10.0 A; 230 V AC	P. 129	Motor Technology, ventilation, agricultural technology: thermocline monitoring for alternating current; separate auxiliary switch is available!
TFA2	Manual motor starters with push-button 3-pole operation Electronic release Thermal contact Operating range 0.10 – 25.0 A; 400 V AC	P. 129	Motor Technology, ventilation, agricultural technology: thermocline monitoring for direct current; separate auxiliary switch is available!
OKN	Manual motor starters with rotary knob 3-pole operation Thermal trip with phase drop protection Setting range 0.25 – 27.0 A; 500 V AC Switching capacity 7.5 kW Switching operations 30/h	P. 133	Motor Technology, A motor protection switch in a compact design – high-pressure washer
CSDU	Star/delta connection CSDU	P. 136	Motor Technology

Manual Motor Starter OKE2, 3-pole



- Thermal trip
- Setting range 1.0 – 25.0 A; 500 V AC
- Switching capacity 11 kW
- Switching operations 60/h
- Including PE/N bar (left side)
- short-circuit release

Order reference	Description Rated current setting range (A)	Packing (units)	Weight (in g)	Part No.
OKE2 016	1,00 – 1,60 A	1	280	202 721
OKE2 025	1,60 – 2,50 A	1	280	202 738
OKE2 040	2,50 – 4,00 A	1	280	202 745
OKE2 063	4,00 – 6,30 A	1	280	202 752
OKE2 100	6,30 – 10,00 A	1	280	202 769
OKE2 160	10,00 – 16,00 A	1	280	202 776
OKE2 250	16,00 – 25,00 A	1	280	202 783

Manual Motor Starter MKE2, 3-pole



- Thermal/magnetic trip
- Setting range 0.10 – 25.0 A; 500 V AC
- Switching capacity 11 kW
- Switching operations 60/h
- Including PE/N bar (left side)
- short-circuit release

Order reference	Description Rated current setting range (A)	Packing (units)	Weight (in g)	Part No.
MKE2 001	0,10 – 0,16 A	1	300	202 158
MKE2 002	0,16 – 0,25 A	1	300	202 165
MKE2 004	0,25 – 0,40 A	1	300	202 172
MKE2 006	0,40 – 0,63 A	1	300	202 189
MKE2 010	0,63 – 1,0 A	1	300	202 196
MKE2 016	1,0 – 1,6 A	1	300	202 202
MKE2 025	1,6 – 2,5 A	1	300	202 219
MKE2 040	2,5 – 4,0 A	1	300	202 226
MKE2 063	4,0 – 6,3 A	1	300	202 233
MKE2 100	6,3 – 10,0 A	1	300	202 240
MKE2 160	10,0 – 16,0 A	1	300	202 257
MKE2 250	16,0 – 25,0 A	1	300	202 264

Technical Data OKE2 / MKE2	
Rated insulation voltage U_i acc. to IEC 947-4-2 / VDE 0110	500 V AC
Permissible ambient temperature	-25...+ 70 °C
Storage temperature	-25...+ 60 °C
open	-25...+ 40 °C
enclosed type	
Temperature compensation	no
Climatic resistance	IEC 68 T2-3, 2-30
Glow wire resistance acc. to IEC 695-2-1	Intensity 850°C
Working position any position	preferably vertical
Permissible altitude	3000 m
Permissible vibration resistance IEC 68-2-6	25 Hz b./- 1 mm Amplitude (2,5 g)
Permissible impact direction sine impact (critical direction IEC 68-2-27)	5 g (11 ms)
Surface mounting screws DIN-rail	2 x M4** integrated
Mechanical life in cycles	100.000
Maximum switching operations Cycles/hour	60

**not included in the scope of delivery

Conductor cross-section OKE2 / MKE2		
Manual motor starters	rigid cable 1 x	1 ... 6,0 mm ²
	rigid cable 2 x	1 ... 4,0 mm ²
	flexible cable* 1 x	1 ... 6,0 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Auxiliary contact	rigid cable 1 x	1 ... 2,5 mm ²
	rigid cable 2 x	1 ... 2,5 mm ²
	flexible cable* 1 x	1 ... 2,5 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Undervoltage/ shunt release	rigid cable 1 x	1 ... 2,5 mm ²
	rigid cable 2 x	1 ... 2,5 mm ²
	flexible cable* 1 x	1 ... 2,5 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Enclosure/ PE/N terminal	rigid cable 1 x	1 ... 4,0 mm ²
	rigid cable 2 x	1 ... 4,0 mm ²
	flexible cable* 1 x	1 ... 2,5 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Degree of Protection acc. to DIN 40050		IP 20
open type enclosed type		IP 55...65

* with cable end sleeve

Undervoltage release OKE2 / MKE2	
Energizing voltage % von U_c	≥ 85
De-energizing voltage % von U_c	35 .. 70
Relative Duty factor % von U_c	100
Power consumption Closing Holding	6,0 VA 3,0 VA

Technical Data OKE2 / MKE2	
Main current paths Number	3
Rated operational voltage U_e bis	16 A 550 V AC 25 A 500 V AC
Rated operational current I_e	25 A
Permissible frequency only for magnetic short-circuit release	40...60 Hz
Current setting ranges I_e OKE2 / MKE2 acc. to VDE 0660 Part 102 A, IEC 947-4-1	1-25 / 0,1-25
Numbers of ranges OKE2 / MKE2	7 / 12
Current dissipation loss Main current paths at I_e max./Phase	1,9...3,7 W 2,6...4,2 W
Tripping curves	10A
Electro-magnetic trip	8 - 13 x I_n

Auxiliary contact OKE2 / MKE2	
Auxiliary current paths Rated insulation voltage IEC 947	230 V
Thermal current I_{th2}	6 A
Short-circuit protection back-up fuse gL MCB B 6 A	10 A B 6 A

Max. switching capacity OKE2 / MKE2	
Auxiliary contact I _e at AC 15 up to	
24 V AC	6 A
230 V AC	4 A
400 V AC	3 A
500 V AC	1 A
may be used for low voltage and PLC inputs acc. to DIN 19240	

Shunt release OKE2 / MKE2	
Energizing voltage % von U_c	ca. 70
Power consumption Closing Holding	6,0 VA 3,0 VA

Manual Motor Starters OKE2 / MKE2

Short circuit switching capacity OKE2 / MKE2	
40 ... 60 Hz P1 / I _{cn} acc. to VDE 0660 / IEC 155-1 Taking the mains back-up fuse into consideration	
230 V	6 kA
400 V	3 kA
440 V	3 kA
500 V	1 kA

Correction factor OKE2 / MKE2	
Ambient temperature	Correction factor
5° C	1,12
+ 20° C	1,00
+ 40° C	0,89

Setting ranges, intrinsic safety and max. back-up fuse OKE2		
Order reference	Setting ranges A	Max. back-up fuse gl (A) 440 / 500 V
OKE2 016	1,0 – 1,6	16
OKE2 025	1,6 – 2,5	25
OKE2 040	2,5 – 4,0	35
OKE2 063	4,0 – 6,3	50
OKE2 100	6,3 – 10,0	63
OKE2 160	10,0 – 16,0	63
OKE2 250	16,0 – 25,0	50

Setting ranges, intrinsic safety and max. back-up fuse MKE2					
Order reference	Setting ranges A	Actuating current of the magn. short-circuit release (A)	max. back-up fuse gl (A)		
			230 V	400 V	500 V
MKE2 001	0,10 – 0,16	1,3	No back-up fuse required		
MKE2 002	0,16 – 0,25	2,0			
MKE2 004	0,25 – 0,40	3,5			
MKE2 006	0,40 – 0,63	5			
MKE2 010	0,63 – 1,0	8			
MKE2 016	1,0 – 1,6	13			
MKE2 025	1,6 – 2,5	20			
MKE2 040	2,5 – 4,0	32		35	25
MKE2 063	4,0 – 6,3	50	63	50	50
MKE2 100	6,3 – 10,0	80	63	63	50
OKE2 160	10,0 – 16,0	128	63	63	50
OKE2 250	16,0 – 25,0	200	63	63	50

Permissible wire protection MKE2					
Order reference	Min. protected cross-section at 400 / 500 V AC, Cu mm²				
MKE2	4	2,5	1,5	1,0	0,75
I _N (A)					
0,16 bis 6,3	X	X	X	X	X
10	X	X	X	X	
16	X	X	X		
25	X	X			

Protection of PVC-insulated cables against thermal overload due to short-circuit:

According to VDE 0100 Parts 430 and 523, cables and wires have to be protected against overload and short-circuit.

The table shows which cable cross-sections are protected against short circuit by the MKE 2.

Accessories OKE2 / MKE2

Order reference	Description	Packing (units)	Weight (in g)	Part No.
	Auxiliary contacts *			
Hi 10	Auxiliary contact 1 N.O., right	1	7,5	202 288
Hi 01	Auxiliary contact 1 N.C., right	1	7,5	202 301
Hi 11	Auxiliary contact 1 N.O./1 N.C.	1	7,5	202 325
	Shunt release			
AS 230-50	Shunt release 230 V / 50 Hz	1	60	202 479
AS 400-50	Shunt release 400 V / 50 Hz	1	60	202 486
	Undervoltage release			
US 110-50	Undervoltage release 110 V / 50 Hz	1	60	202 370
US 230-50	Undervoltage release 230 V / 50 Hz	1	60	202 387
US 400-50	Undervoltage release 400 V / 50 Hz	1	60	202 400
	Enclosure/Special accessories			
A IP 41	Enclosure, protection IP 41, up to 16 A	1	285	202 547
A IP 55	Enclosure, protection IP 55, up to 16 A	1	210	202 554
B IP 55	Enclosure with large terminal box, protection IP 55	1	450	202 561
C IP 54	Enclosure, protection IP 54, 5-pole, CEE-plug 16 A	1	375	202 585
E IP 54	Front plate, protection IP 54	1	125	202 622
	Enclosure-accessories			
NAK	Emergency-OFF-device IP 55	1	55	202 653
V	Padlock blockade device IP 55	1	40	202 660

*Auxiliary contacts, shunt and undervoltage releases must be factory installed.

Manual Motor Starters



Manual motor starter
MKE2 + AS



Manual motor starter
MKE2 + US



Front plate E IP-54

Enclosure



Enclosure A



Enclosure A +
Emergency-OFF-device NAK

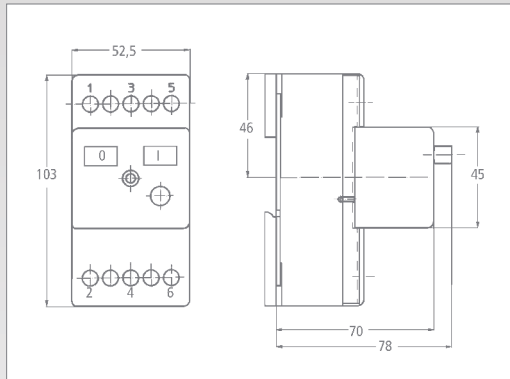


Enclosure B + Padlock
blockade device V

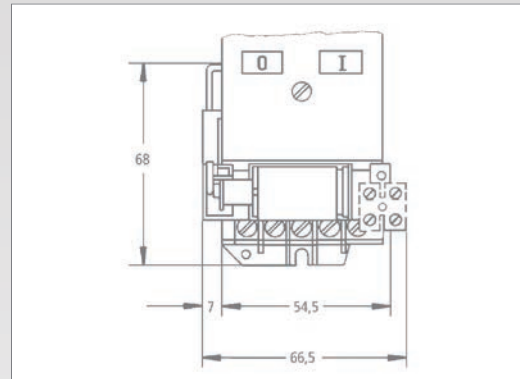


Enclosure C

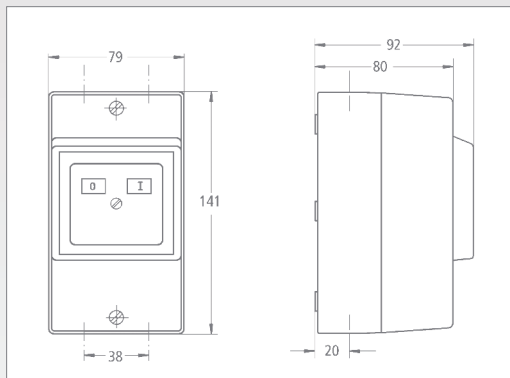
Manual Motor Starters OKE2 / MKE2



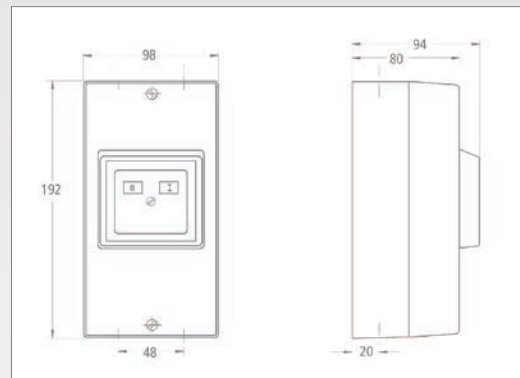
Manual motor starter OKE2 / MKE2



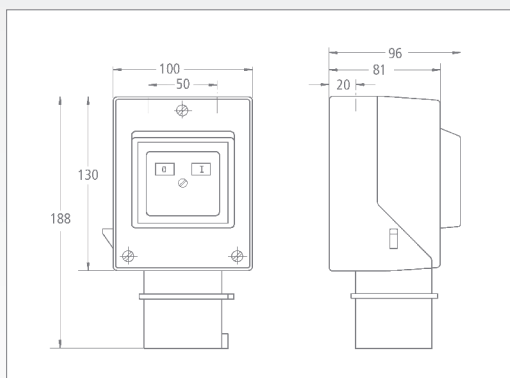
Undervoltage release US, Shunt release AS



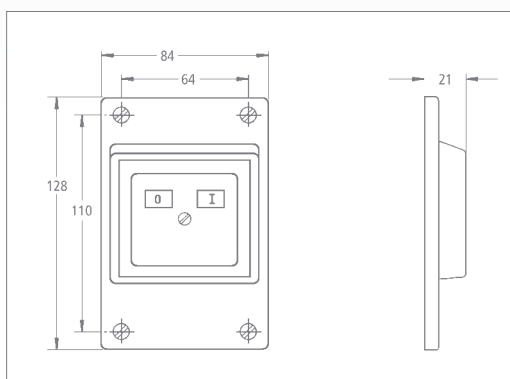
Enclosure A



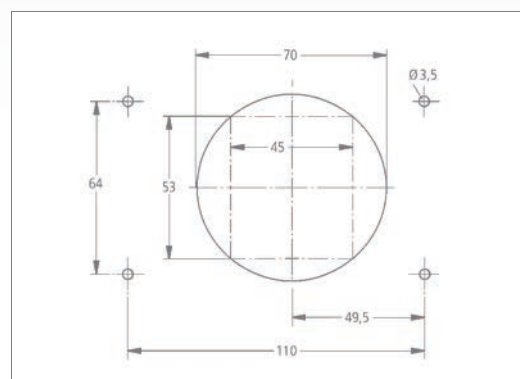
Enclosure B



Enclosure C

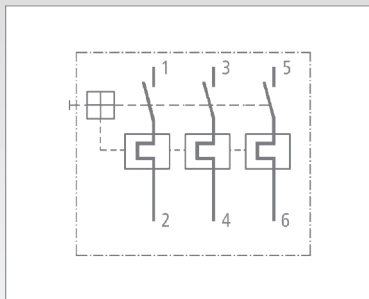


Front plate, protection E

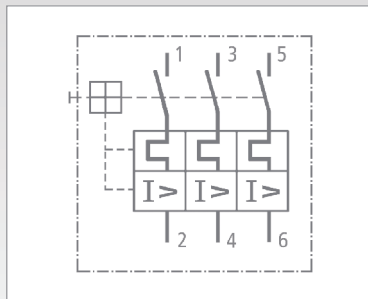


Mounting template for Front plate E

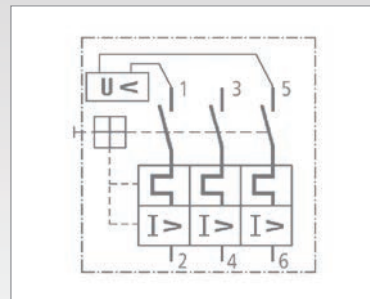
Circuit Diagrams OKE2 / MKE2



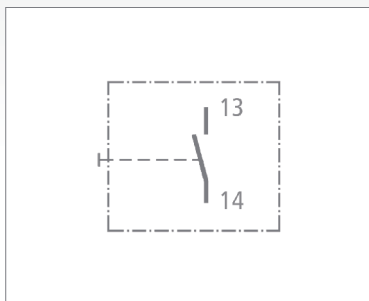
Manual motor starter OKE2



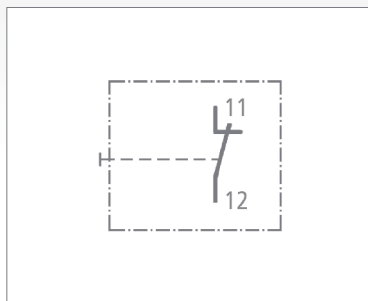
Manual motor starter MKE2



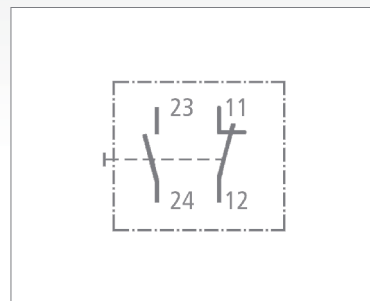
Manual motor starter MKE2
with undervoltage release



Auxiliary contact Hi 10 (1 N.O.)

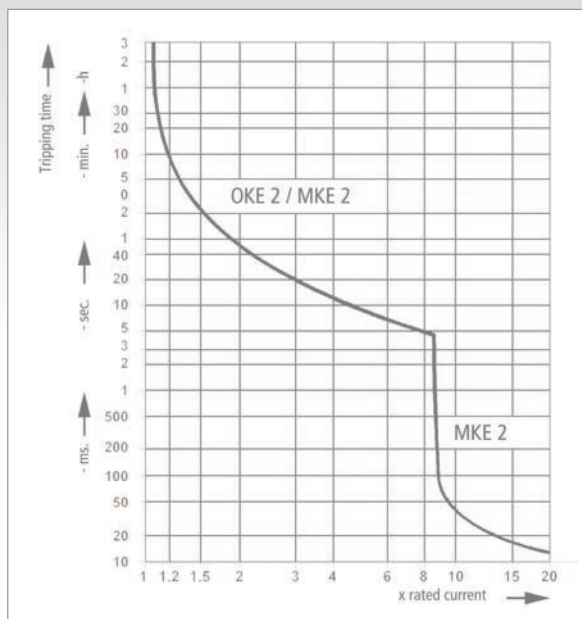


Auxiliary contact Hi 01 (1 N.C.)



Auxiliary contact Hi 11 (1 N.O. / 1 N.C.)

Tripping curves OKE2 / MKE2



Motor starter for motors with integrated thermal contacts TFE



- 1-phase version 230 V (1~)
- Thermal/magnetic trip
- Thermal contact
- Operating range 0.4 – 10.0 A; 230 V AC

Order reference	Type Code	Description Rated operational current setting range	Packing (units)	Weight (in g)	Part No.
TFE2 230		Standard unit 0,40 – 10,0 A	1	280	210 078

Motor starter for motors with integrated thermal contacts TFA



- 3-phase version 400 V (3~)
- Electronic trip
- Thermal contact
- Operating range 0.10 – 25.0 A; 400 V AC

Order reference	Type Code	Description Rated operational current setting range	Packing (units)	Weight (in g)	Part No.
TFA2 400		Standard unit 0,10 – 25,0 A	1	340	210 061

Use and function

The manual motor starters of the series TFA and TFE protect the electronic motors from damages caused by thermal overload.

Contrary to the manual motor starters of the series MKE2 / OKE 2 the adapted motor current is not monitored but the coil temperature.

For this the motor needs to be equipped with a thermal contact (Klixon, PTC-resistance). When critical temperatures are achieved these will get highly resistive. As a result the motor protection stops the power supply.

The applications are motors which are used in very dusty environments (e.g. fans, saws...). The motor cooling is often effected by deposits.

Technical Data TFE2 / TFA2	
Rated insulation voltage U_i acc. to IEC 947-4-2 / VDE 0110	500 V AC
Permissible ambient temperature	-25...+ 70 °C
Storage temperature	-25...+ 60 °C
open	-25...+ 40 °C
enclosed type	
Temperature compensation	no
Climatic resistance	IEC 68 T2-3, 2-30
Glow wire resistance acc. to IEC 695-2-1	Intensity 850°C
Working position any position	preferably vertical
Permissible altitude	3000 m
Permissible vibration resistance IEC 68-2-6	25 Hz b./- 1 mm Amplitude (2,5 g)
Permissible impact direction sine impact (critical direction IEC 68-2-27)	5 g (11 ms)
Surface mounting screws DIN-rail	2 x M4** integrated
Mechanical life in cycles	100.000
Maximum switching operations Cycles/hour	60

**not included in the scope of delivery

Conductor cross-section TFE2 / TFA2		
Manual motor starters	rigid cable 1 x	1 ... 6,0 mm ²
	rigid cable 2 x	1 ... 4,0 mm ²
	flexible cable* 1 x	1 ... 6,0 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Auxiliary contact	rigid cable 1 x	1 ... 2,5 mm ²
	rigid cable 2 x	1 ... 2,5 mm ²
	flexible cable* 1 x	1 ... 2,5 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Undervoltage/ shunt release	rigid cable 1 x	1 ... 2,5 mm ²
	rigid cable 2 x	1 ... 2,5 mm ²
	flexible cable* 1 x	1 ... 2,5 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Enclosure/ PE/N terminal	rigid cable 1 x	1 ... 4,0 mm ²
	rigid cable 2 x	1 ... 4,0 mm ²
	flexible cable* 1 x	1 ... 2,5 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Degree of Protection acc. to DIN 40050		IP 20
open type enclosed type		IP 55...65

* with cable end sleeve

Undervoltage release OKE2 / MKE2	
Energizing voltage % von U_c	≥ 85
De-energizing voltage % von U_c	35 .. 70
Relative Duty factor % von U_c	100
Power consumption Closing Holding	6,0 VA 3,0 VA

Technical Data TFE2 / TFA2	
Main current paths Number	3
Rated operational voltage U_e up to	16 A 550 V AC 25 A 500 V AC
Rated operational current I_e	25 A
Permissible frequency only for magnetic short-circuit release	40...60 Hz
Current setting ranges I_e TFE2 / TFA2 Acc to VDE 0660 Part 102 A, IEC 947-4-1	0,4-10 / 0,1-25
Numbers of ranges TFE2 / TFA2	1 / 1
Current dissipation loss Main current paths at I_e max./Phase	ca. 4,2 W
Tripping curves	10A
Electro-magnetic trip	8 - 13 x I_n

Auxiliary contact OKE2 / MKE2	
Auxiliary current paths Rated insulation voltage IEC 947	230 V
Thermal current I_{th2}	6 A
Short-circuit protection back-up fuse gL MCB B 6 A	10 A B 6 A

Max. switching capacity TFE2 / TFA2		
Auxiliary contact I _e at AC 15 up to	24 V AC 230 V AC 400 V AC 500 V AC	6 A 4 A 3 A 1 A
may be used for low voltage and PLC inputs acc. to DIN 19240		

Shunt release OKE2 / MKE2	
Energizing voltage % von U_c	approx. 70
Power consumption Closing Holding	6,0 VA 3,0 VA

Manual Motor Starters TFE2 / TFA2

Accessories TFE2 / TFA2

Order reference	Description	Packing (units)	Weight (in g)	Part No
Auxiliary contacts*				
Hi 10	Auxiliary contact 1 N.O., right	1	7,5	202 288
Hi 01	Auxiliary contact 1 N.C., right	1	7,5	202 301
Hi 11 (nur TFE)	Auxiliary contact 1 N.O./1 N.C.	1	7,5	202 325
Enclosure/Special accessories				
A IP 55	Enclosure, protection IP 55, up to 16 A	1	210	202 554
B IP 55	Enclosure with large terminal box, protection IP 55	1	450	202 561
E IP 54	Front plate, protection IP 54	1	125	202 622
Enclosure-accessories				
NAK	Emergency-OFF-device IP 55	1	55	202 653
V	Padlock blockade device IP 55	1	40	202 660
AZ	Supplementary set for enclosure, protection IP 41 to IP 55	1	25	216 742

*Auxiliary contacts, shunt and undervoltage releases must be factory installed.

Enclosure / Padlock



Enclosure A



Enclosure A +
Emergency-OFF-device NAK

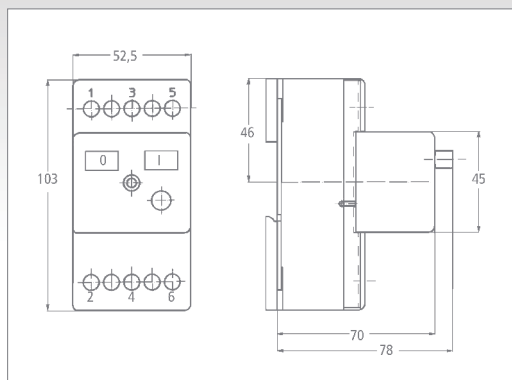


Enclosure B +
Padlock blockade device V

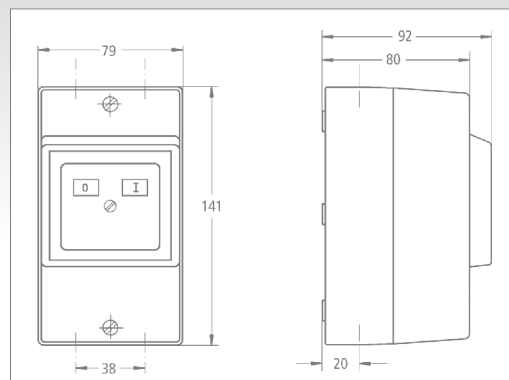


Front plate E

Dimensions / Circuit Diagrams TFE2 / TFA2

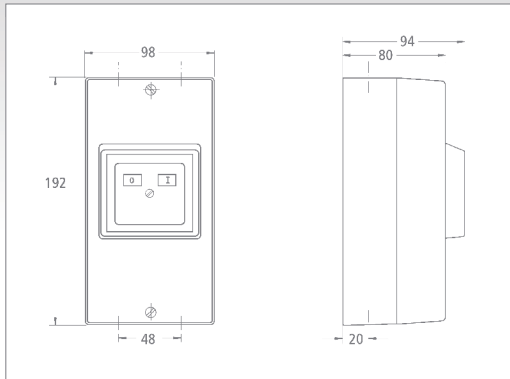


Manual motor starter TFE2 / TFA2

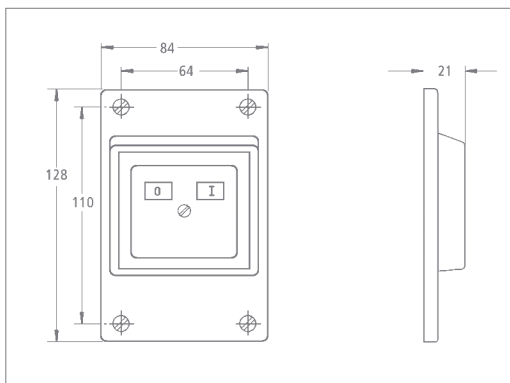


Enclosure A

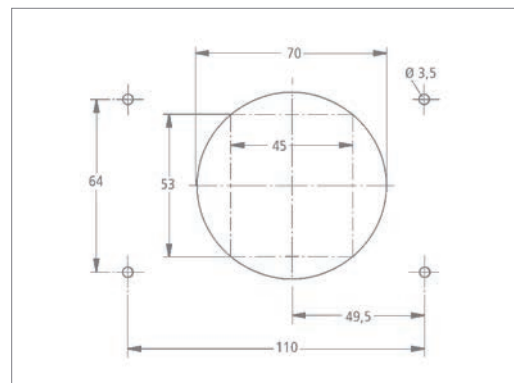
Dimensions / Circuit Diagrams TFE2 / TFA2



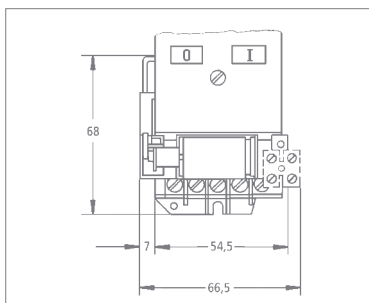
Enclosure B



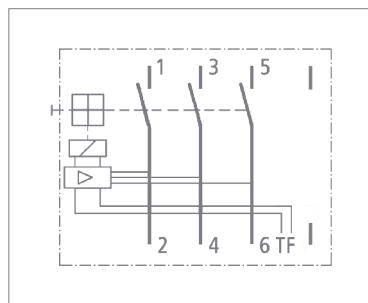
Front plate E



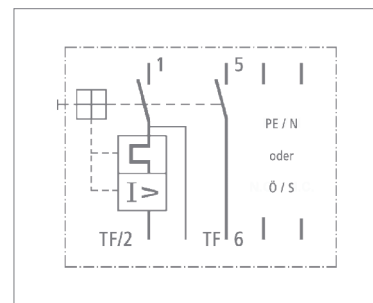
Mounting template for Front plate E



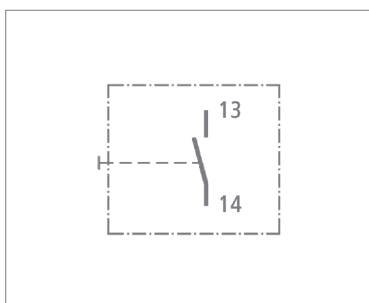
Undervoltage release US (TFA2)



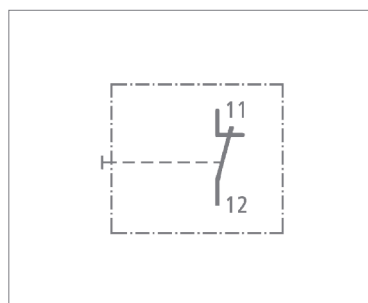
Manual motor starter TFA2



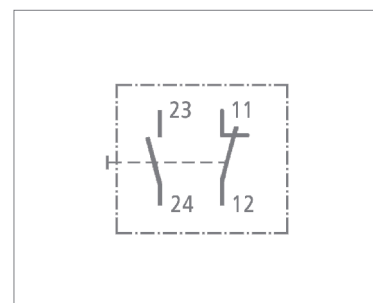
Manual motor starter TFE2
optional 1N.O. and/or 1N.C.



Auxiliary contact Hi 10 (1 N.O.)



Auxiliary contact Hi 01 (1 N.C.)



Auxiliary contact Hi 11 (1 N.O. / N.C.)

Manual motor starter with rotary knob, 2/3-pole



- Thermal trip with phase-drop protection
- Manual motor starters with rotary knob
- Setting range 0.25 – 27.0 A; 500 V AC
- Switching capacity 7.5 kW
- Switching operations 30/h

Order reference	Type Code	Description Rated current setting range (A)	Packing (units)	Weight (in g)	Part No.
OKN 0,4		0,25 – 0,40 A	1	170	203 391
OKN 0,63		0,40 – 0,63 A	1	170	203 407
OKN 1,0		0,63 – 1,00 A	1	170	203 414
OKN 1,6		1,00 – 1,60 A	1	170	203 421
OKN 2,5		1,60 – 2,50 A	1	170	203 438
OKN 4,0		2,50 – 4,00 A	1	170	203 445
OKN 6,3		4,00 – 6,30 A	1	170	203 452
OKN 10,0		6,30 – 10,0 A	1	170	203 469
OKN 16,0		10,0 – 16,0 A	1	170	203 476
OKN 22,0		16,0 – 22,0 A	1	170	203 483
OKN 27,0		22,0 – 27,0 A	1	170	203 490
OKN 30,0		22,0 – 30,0 A (2-pole)	1	170	203 506
OKN 37,0		28,0 – 37,0 A (2-pole)	1	170	236 665

Technical Data OKN	
Rated insulation voltage U_i acc. to IEC 947-4-7 / VDE 0110	500 V AC
Permissible ambient temperature	-25...+ 70 °C
Storage temperature	-25...+ 60 °C
open	-25...+ 40 °C
enclosed type	
Temperature compensation	yes
Climatic resistance	IEC 68 T2-3, 2-30
Glow wire resistance acc. to IEC 695-2-1	Intensity 850°C
Working position	preferably vertical
Permissible altitude	3000 m
Permissible vibration resistance IEC 68-2-6	25 Hz b.+/- 1 mm Amplitude (2,5 g)
impact (critical direction IEC 68-2-27)	5 g (11 ms)

Technical Data OKN	
Surface mounting	2 x M4*
Screw mounting	
Mechanical life in cycles	100.000
Maximum switching operations Cycles/hour	30
Main current paths Number	2 / 3
Rated operational voltage U_e up to	37 A / 250 V 27 A / 500 V
Thermal current I_{th} Rated operational current I_e	37 A, 2-pol / 27 A, / 3-pol
Current setting ranges I_e acc. to VDE 0660 Teil 102 A, IEC 947-4-1	22 – 37 A, 2-pol 0,25 – 27 A, 3-pol
Numbers of ranges	2 / 11
Current dissipation loss Main current paths at $I_{e \max.}$ /Phase	1,8...3,2 W
Trip class	10A

*not included

Conductor cross-section OKN		
Manual motor starters	rigid cable 1 x	1 ... 6,0 mm ²
	rigid cable 2 x	1 ... 4,0 mm ²
	flexible cable* 1 x	1 ... 4,0 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Enclosure/ PE/N terminal	rigid cable 1 x	1 ... 6,0 mm ²
	rigid cable 2 x	1 ... 4,0 mm ²
	flexible cable* 1 x	1 ... 4,0 mm ²
	flexible cable* 2 x	1 ... 2,5 mm ²
Degr. of protection acc. to DIN 40050		IP 20
open type / enclosed type		IP 54

* with cable end sleeve

Contact rating at AC 3 OKN	
230 V	- 7,5 kW
400 V	- 11,5 kW
500 V	- 14 kW

Switching capacity OKE2 / MKE2	
40 ... 60 Hz P1 / I _{cn} acc. to VDE 0660 / IEC 155-1 allowing for the mains back-up fuse	
230 V	6 kA
400 V	3 kA
440 V	3 kA
500 V	1 kA

Setting ranges, intrinsic safety and max. back-up fuses OKN

Order reference	Setting range A	max. back-up fuse gL (A)	
		1 x 250 V	3 x 230 V, 3 x 500 V
OKN 0,4	0,25 – 0,40 A	-	2
OKN 0,63	0,40 – 0,63 A	-	6
OKN 1,0	0,63 – 1,00 A	-	10
OKN 1,6	1,00 – 1,60 A	-	16
OKN 2,5	1,60 – 2,50 A	-	25
OKN 4,0	2,50 – 4,00 A	-	35
OKN 6,3	4,00 – 6,30 A	-	63
OKN 10,0	6,30 – 10,0 A	-	63
OKN 16,0	10,0 – 16,0 A	-	63
OKN 22,0	16,0 – 22,0 A	-	35
OKN 27,0	22,0 – 27,0 A	-	35
OKN 30,0	22,0 – 30,0 A	50	-
OKN 37,0	28,0 – 37,0 A	50	-

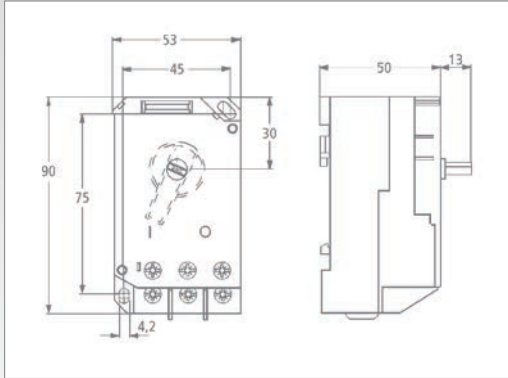
Accessories OKE2 / MKE2

Order reference	Description	Packing (units)	Weight (in g)	Part No
	Enclosure-accessories			
H	Enclosure H, protection IP 41	1	225	203 513

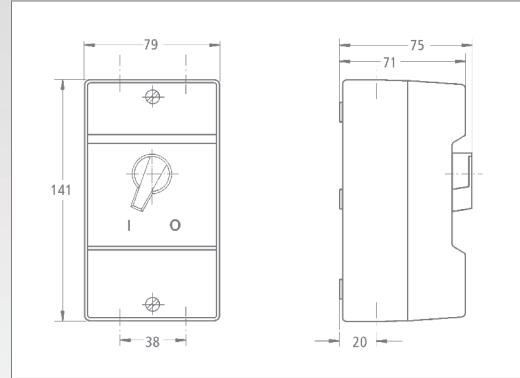
Enclosure



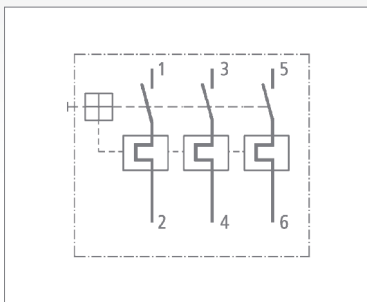
Dimensions OKN



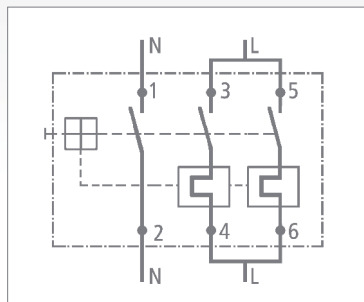
Manual motor starter OKN



Enclosure H

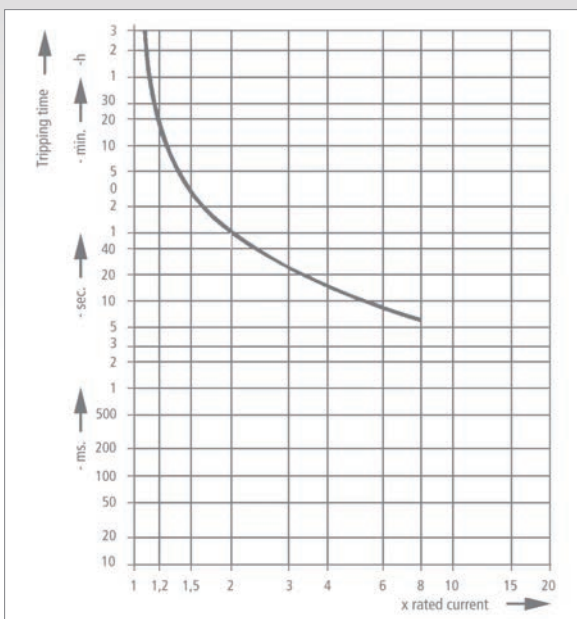


Manual motor starter OKN



Manual motor starter
OKN 30 u. OKN 37 (2-pol.)

Tripping curves OKN



Star/delta connection for the protective start of the motor

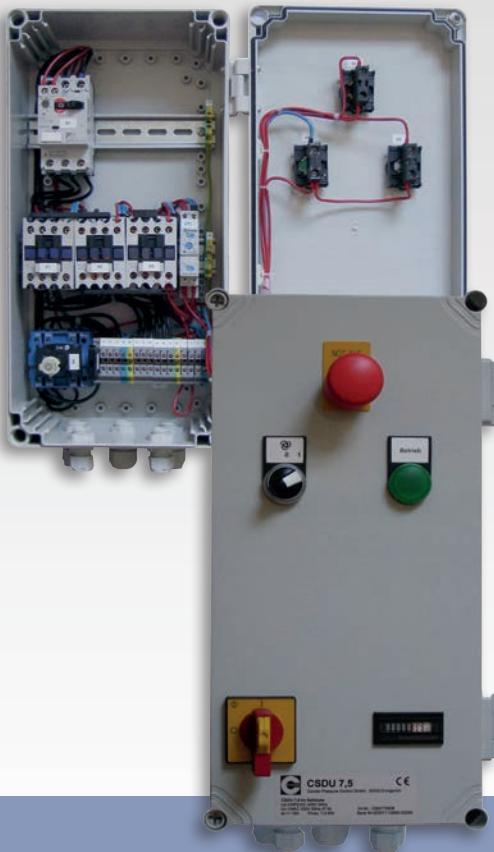


Fig. CSDU 7,5 complete

The Condor Pressure Control GmbH CSDU Star/delta connection offers, in due consideration of the relevant standards, the possibility of economically operating motors with a switching capacity greater than 4 kW using public mains networks.

With this 2-stage starter the inrush current (star circuit) is reduced by 1/3 of the height to be expected when starting the motor directly. The torque is equally reduced during start-up phase.

During the start-up phase (1 – 32 seconds), a special change-over relay with a contact switching time of 50 ms, guarantees reliable change over from star to delta operation.

During continuous operation, all motors connected to the Star/delta connection are protected by a manual motor starter with thermal and magnetic trip.

Standard executions contain a manual motor starter and an on / off switch for the control circuit. Complete star/delta connections additionally have a main circuit-breaker with enclosure locking, an emergency button, an hour meter and an operating LED.

Star/delta connections as standard-version with an additional transformer are used, if there is no neutral leader connected.

Type overview CSDU

Order reference	Description	Weight (in g)	Part No.
Complete version			
CSDU 5,5 complete	5,5 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter: 9 - 13 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	4100	256601
CSDU 7,5 complete	7,5 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 14 - 20 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	4250	256618
CSDU 11,0 complete	11 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 19 - 25 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	4400	256625
CSDU 15,0 complete	15 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 28 - 40 A (Rated current) Enclosure 300 x 400 x 140 mm (width x height x depth)	4550	256632
Standard version			
CSDU 5,5 standard	5,5 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 9 - 13 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	3500	256656
CSDU 7,5 standard	7,5 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 14 - 20 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	3650	256663
CSDU 11,0 standard	11 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 19 - 25 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	3800	256670
CSDU 15,0 standard	15 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 28 - 40 A (Rated current) Enclosure 300 x 400 x 140 mm (width x height x depth)	3950	256687
Standard version with transformer (trafo)			
CSDU 5,5 trafo	5,5 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 9 - 13 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	4300	256717
CSDU 7,5 trafo	7,5 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 14 - 20 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	4450	256724
C-DU 11,0 trafo	11 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 19 - 25 A (Rated current) Enclosure 200 x 400 x 140 mm (width x height x depth)	4600	256731
CSDU 15,0 trafo	15 kW, Ue: 400V AC / 50 Hz, Supply line: 3L/N/PE Manual motor starter 28 - 40 A (Rated current) Enclosure 300 x 400 x 140 mm (width x height x depth)	4750	256748

Other manual motor starters on request.



Test devices

Industries

VARIOTEST

The Condor-VARIOTEST is a universal test instrument featuring acoustic signals for:

P. 139

Testing technology

ROTATEST

The Condor-ROTATEST is a Phase-sequence indicator with optical display

P. 140

Testing technology

CSG420

The Condor-CSG420 is an adjustable sensor simulator 4-20 mA

P. 142

Testing technology



Multifunction timer relay

Industries

FMF

Multifunction timer relay in compact industrial standard casing
8 switchable time ranges
universal current

P. 143

Controls

IMF

Multifunction timer relay featuring installation type dimensions
4 switchable time ranges
universal current

P. 146

Controls

VARIOTEST



The Condor-Variotest is a universal test instrument featuring acoustic signals for:

Continuity and/or resistance testing up to 20 k Ω



Direct and alternating voltage checking up to 500 V



Polarity test for D.C. from 6 V to 500 V



Phase checking (outer conductor) Mp conductor and protective conductor



Checking function of RCCB's with I Δ N max. 30 mA



Semi-conductor testing

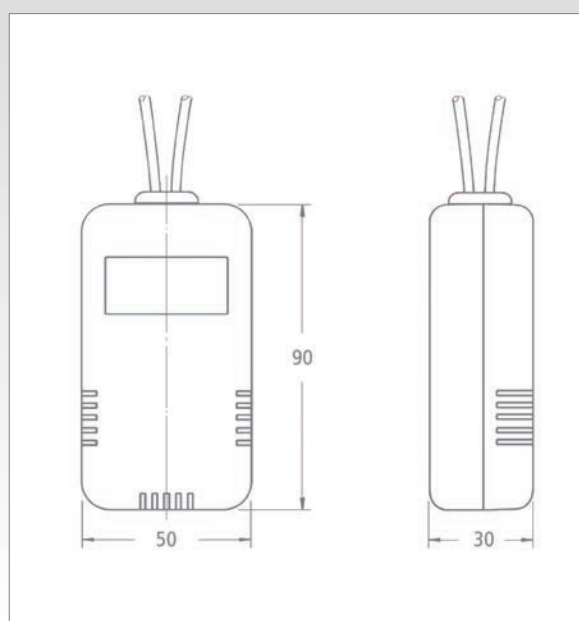
The Condor-VARIOTEST

- is protected against external voltages up to 500 V and limits the current input to max. 4 mA. Destruction as a result of incorrect handling is practically impossible.
- distinguishes between D.C. and A.C. voltages or a resistance value by sound pitch and frequency change respectively.
- is equipped with an ON-OFF switch.
- is supplied with the battery inserted and is ready for immediate use.
- Measuring probes and leads acc. to IEC 1010 Part 2-031.

Order reference	Packing (units)	Weight (in g)	Part No.
VARIOTEST	1	115	260301

Technical Data / Dimensions

Technical Data Variotest	
Test range	0 – 20 k Ω 0 – 500 V
Audio frequency	up to 20 kHz
Leads	80 cm
Measuring probes	crush proof
Protection	protective double insulation
Clearance and creepage distances	acc. to VDE 0110
Power supply	Battery 9 V Block
Included in the scope of supply	IEC 6F22



ROTATEST



The Condor-Rotatest indicates the phase sequence in a three-phase mains circuit and thus the direction of rotation for electromotive appliances.

The additional phase monitoring glow lamps also indicate whether all the outer conductors are live and ensure that the neutral and outer conductors have not been interchanged.

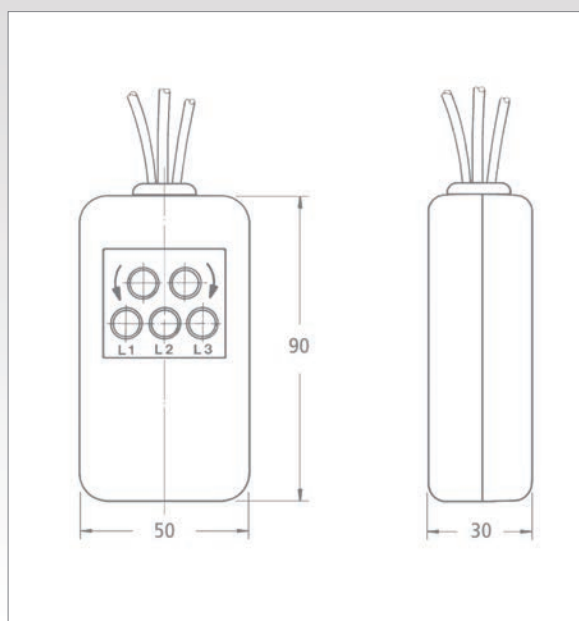
VDE 0100 stipulates:
Three-phase sockets shall be connected in such a manner that a rotation field to the right is reached when looking at the front of the sockets clockwise.

Measuring probes and leads acc. to IEC 1010 Part 2-031.

Order reference	Packing (units)	Weight (in g)	Part No.
ROTATEST	1	195	260318

Technical Data / Dimensions

Technical Data Rotatest	
Voltage range	250 V up to max. 650 V
Current consumption at 380 V	5 mA
Duty factor ED at 380 V	100 %
Leads	80 cm
Measuring probes	crush proof
Clearance and creepage distances	acc. to VDE 0110





CSG420

The sensor simulator Condor-CSG420 is used to simulate a level sensor (4 – 20 mA) on an electronic control unit

Functions:

Adjustable DC current 4 – 20 mA
Measurement of the terminal voltage

Features

LCD – Display
Functions selector switch
Potentiometer for current adjustment

Applications

- Commissioning
- Repairs
- Trouble shooting

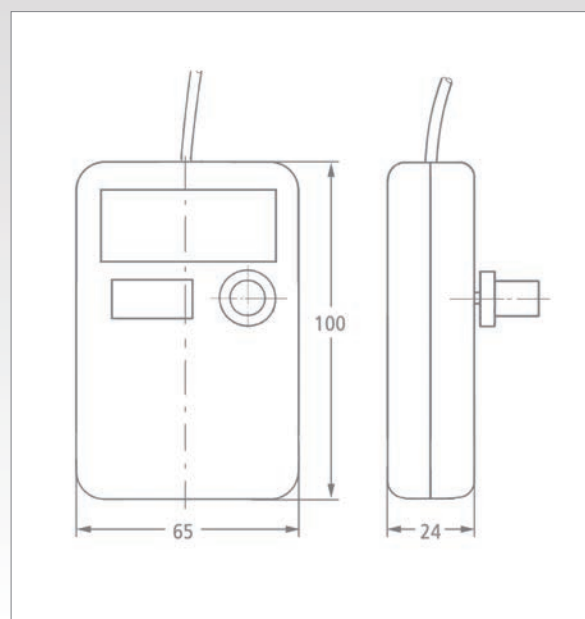
Operational after aiming of the supply-tension.



Order reference	Packing (units)	Weight (in g)	Part No.
CSG420	1	220	249634

Technical Data / Dimensions

Technical Data CSG420	
Adjustable current range	3,5 mA up to 25,5 mA
Terminal voltage measuring range	8,5 V up to 32 V
Display accuracy	2 % v. E. ± 1 Digit
Leads	ca. 100 cm
Clearance and creepage distances	acc. to VDE 0110
Power supply	Battery 9 V Block IEC 6F22
Included in the scope of supply	



Multifunction timer relay FMF



- Multifunction relay in compact industrial standard casing
- 8 selectable time ranges
- Universal current
- 2 SPDT's
- Remote-control terminal
- Voltage activation

The multifunction timer relay FMF is specifically designed for rough industrial environments. All inputs and outputs are both interference free and non-destructive at voltage surges of up to 2 kV. Contact activation may be carried out not only by conventional means such as an isolated contact (between A1 and B1) but also by applying the operating voltage to B1. This helps to reduce wiring and contact requirements of the control and prevents destruction of the devices due to faulty wiring.

Adjustable functions:

- delay on make
- on-delay single shot
- delay on break
- flashing

Remote control:

A remote control can be realized with 2 wires connected to the terminals Z1 / Z2 and a 100 kΩ potentiometer, whereby the FMF potentiometer must be set to 0.

Order reference	Time	Operating voltage U_B (V-AC/DC)	SPDT's	Part No.
FMF	0,1 s – ca. 7 h	22,5 – 240	2	230403

Technical Data

Technical Data FMF	
Permissible operating voltage range	± 10%
Operating voltage influence at ± 10% operating voltage fluctuation	< 0,5 %
Duty factor ED	100%
Permissible ambient and media temperature	- 20°C up to +60°C
Permissible ambient humidity rel. humidity, non-condensing	10% up to 90%
Permissible storage temperature	- 40°C up to +80°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 2 VA

Output contacts FMF	
Series voltage acc. to VDE 0660 and VDE 0110 Group C	250 V-AC
Maximum continuous current 1-change-over, 2-change-over	6 A-AC
Maximum switching capacity per contact	1.500 VA (AC) 50 W (DC)
Mechanical life Cycles	approx. 1×10^7
Electrical life (max. load) Cycles	approx. 2×10^5
Resistance of remote-control Standard	100 kΩ

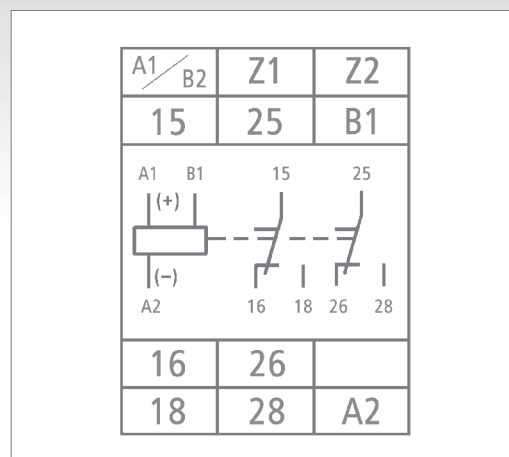
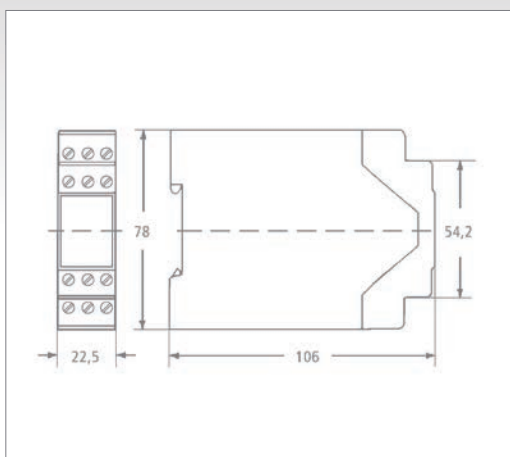
Multifunction timer relay FMF

Enclosure data	
Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure-protection	IP 40
Protection against shock	acc. VBG 4
Terminals	Screw terminals with self-lifting clamps
Cross-section	2 x 1,5 mm ²
Weight	200 g

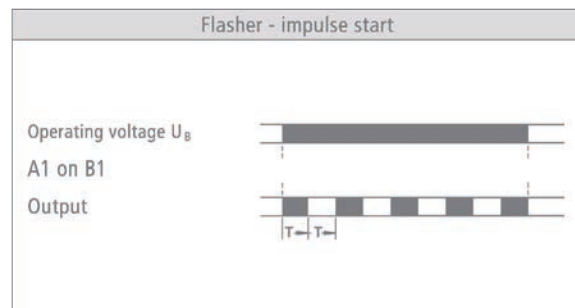
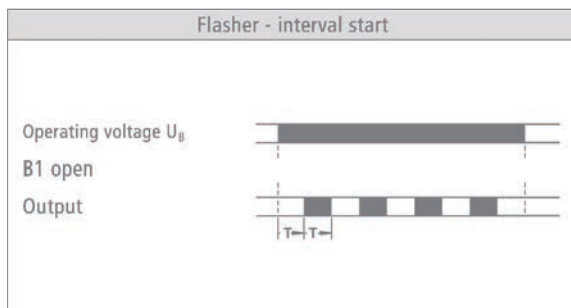
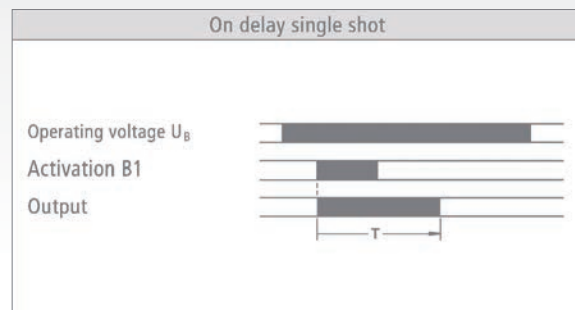
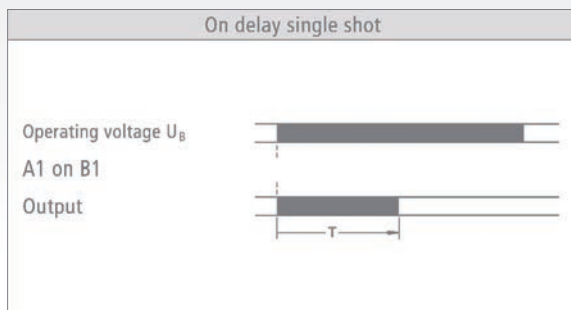
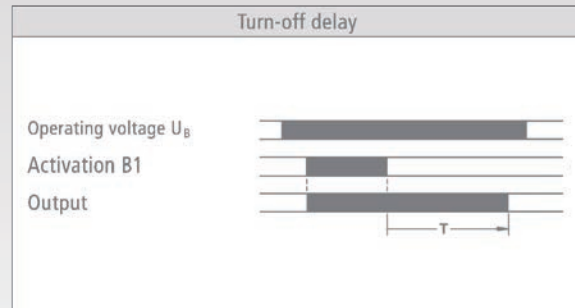
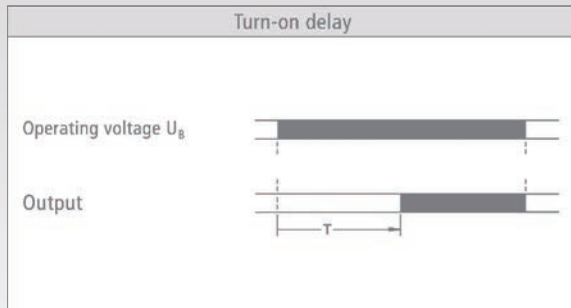
General data	
Tolerance range	± 10%
Repeatability	± 0,5 %
Temperature range	approx. 0,2 % / °C
Recovery time	< 100 ms

Time ranges	
Initial value	End value
0,05 s	1 s
0,2 s	4 s
1,6 s	32 s
12,5 s	250 s
5 s	100 s
20 s	400s
160 s (ca. 2,7 min)	3200 s (ca. 53 min)
1250 s (ca. 21 min)	25000 s (ca. 417 min)

Dimensions- / Circuit Diagram FMF



Functional Overview FMF



Multifunction timer relay IMF



- Multifunction relay featuring installation type dimensions
- 4 selectable time ranges
- Universal current
- 1 SPDT
- Contact activation

The multifunction timer relay IMF is specifically designed for rough industrial environments. All inputs and outputs are both interference free and non-destructive at voltage surges of up to 2.000 V. Contact activation may be carried out not only by conventional means such as a voltage-free contact (between A1 and B1), but also by applying the operating voltage to B1. This helps to reduce wiring and contact requirements of the control and prevents destruction of the devices due to faulty wiring.

Adjustable functions:

- delay on make
- delay on break
- on-delay single shot
- flashing

Order reference	Time	Operating voltage U_B (V-AC/DC)	SPDT's	Part No.
IMF	0,6 s – 60 min	12 – 240 $\pm$ 10 %	1	230410

Technical Data

Technical Data FMF	
Permissible operating voltage range	$\pm$ 10%
Operating voltage influence at $\pm$ 10% operating voltage fluctuation	< 0,5 %
Duty factor ED	100%
Permissible ambient and media temperature	- 20°C up to +60°C
Permissible ambient humidity rel. humidity, non-condensing	10% up to 90%
Permissible storage temperature	- 40°C up to +80°C
Clearance and creepage distances	VDE 0110
Working position	any position
Power consumption	max. 2 VA

Output contacts FMF	
Series voltage acc. to VDE 0660 and VDE 0110 Group C	250 V-AC
Maximum continuous current 1-change-over, 2-change-over	6 A-AC
Maximum switching capacity per contact	1.500 VA (AC) 50 W (DC)
Mechanical life Cycles	approx. 1×10^7
Electrical life (max. load) Cycles	approx. 2×10^5

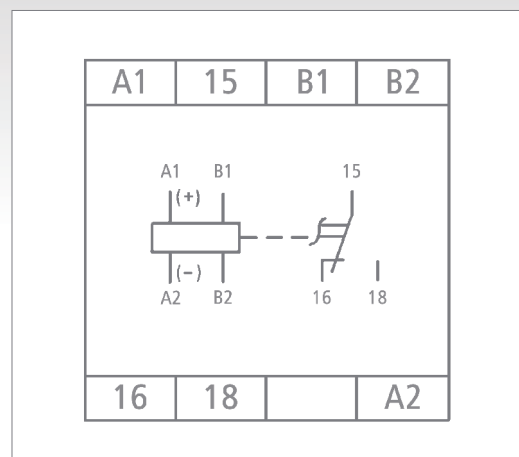
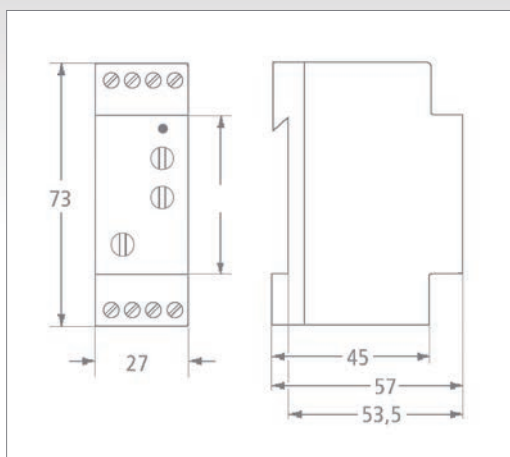
Multifunction timer relay FMF

Enclosure data	
Material	ABS flameproof, UL-approved
Mounting	snap on 35 mm DIN-rail connector acc. to EN 50 035
Enclosure-protection	IP 40
Protection against shock	approx VBG 4
Terminals	elevator clamp
Cross-section	2,5 mm ²
Weight	75 g

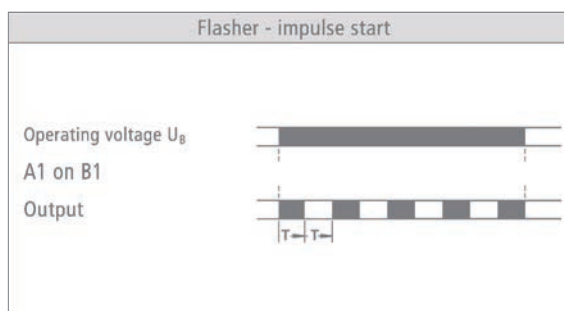
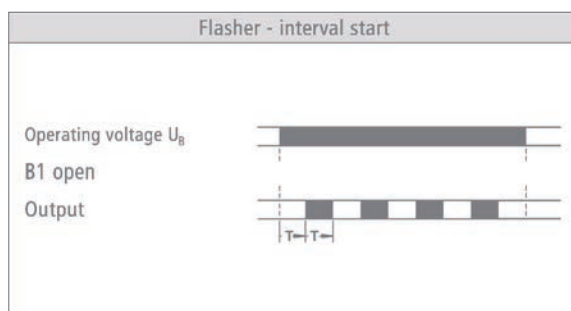
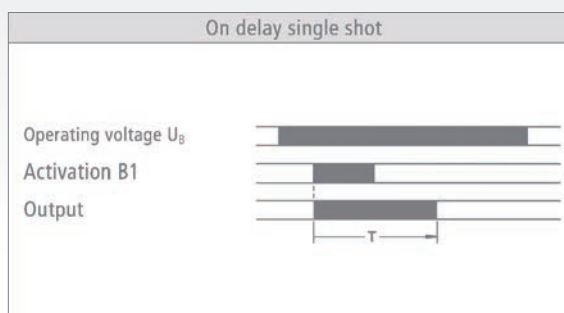
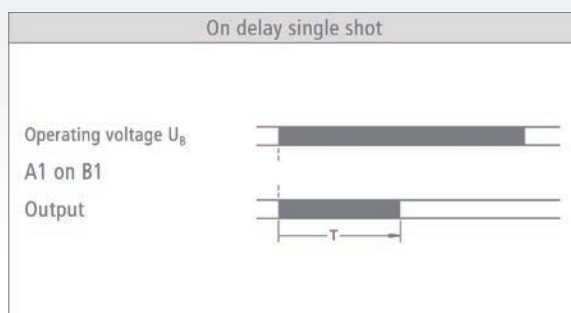
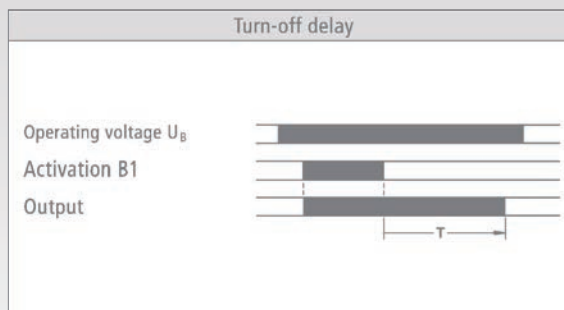
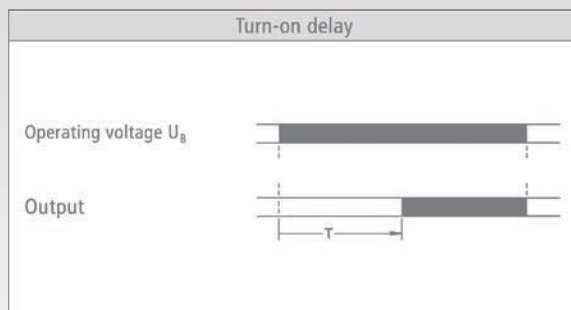
General data	
Tolerance range	± 10%
Repeatability	± 0,5 %
Temperature range	ca. 0,2 % / °C
Recovery time	< 100 ms

Time ranges	
Initial value	End value
0,6 s	6 s
6 s	60 s
0,6 min	6 min
6 min	60 min

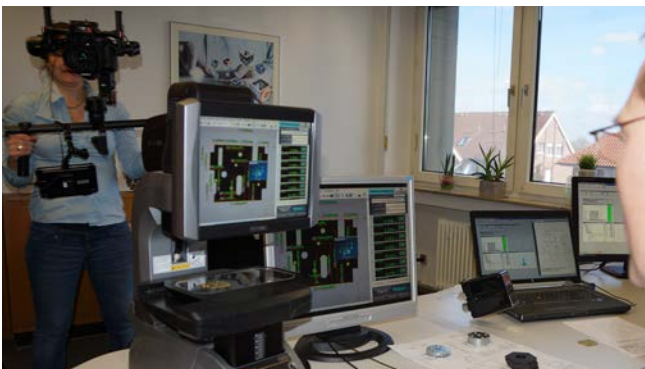
Dimensions- / Circuit Diagram FMF



Functional Overview IMF



"Condor goes Hollywood"





Condor

Head Office and Subsidiaries



Holding



Condor-Werke Gebr. Frede GmbH

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Condor

More information and contact details about our representatives can be found on our website www.condor-werke.com





Condor Werke USA, Inc.

A Condor-Werke Company



In 1999 Condor Werke USA, Inc. was founded for the distribution of Condor products, with its headquarters in Charlotte, North Carolina.

Its own development department offers support in the manufacturing of special products and product variations for the unique requirements of the American market.

Following intensive tests in the testing laboratory, the distribution of the product line began via our centrally located logistics center in Kentucky

In this location, custom devices and special product variations are also produced by our assembly department.

This enables us to work with the flexibility required to react to customer requests at any time.

Condor Werke USA today counts a number of notable manufactures in North-, Central- and South America among its clientele.

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Scharco Electronics

A Condor Werke Company



In 1961 Scharco was founded as a manufacturer of time-, measuring and monitoring relays. With 50 years of experience in the field of control technology, today Scharco develops and manufactures customer-specific solutions in a variety of areas of industrial electronics.

Working together – from idea to product

In keeping with this motto, Scharco offers a comprehensive range of services; from product concept and development right up to manufacturing on our production line, Scharco provides its customers with complete, proactive support in the development of custom-made control solutions.

Scharco's expertise includes, for example, the following key areas:

- Water technology,
- Compressed air technology,
- Cash desk control (check-out),
- Vehicle workshop equipment

Scharco's knowledge of its customer's requirements with regard to applications enables them to provide effective consultation and to work together with the customer in developing products that are attractive and in keeping with the current market.

Given this specialist knowledge of the requirements of certain market sectors, it is not without reason that Scharco is one of Europe's leading manufacturers.

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You find the current price list on our homepage www.condor-cpc.com as pdf-file for downloading.

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Impressum

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Publisher: Condor Pressure Control GmbH, www.condor-cpc.com
Concept and design: Hahn Design, www.hahndesign.de
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... the inventor of the pressure switch



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