Honeywell

FEMA

Product Catalog

Pressure Switches

Pressure Transmitters

Thermostats

Temperature Transmitters

Solenoid Valves

Flow Monitors

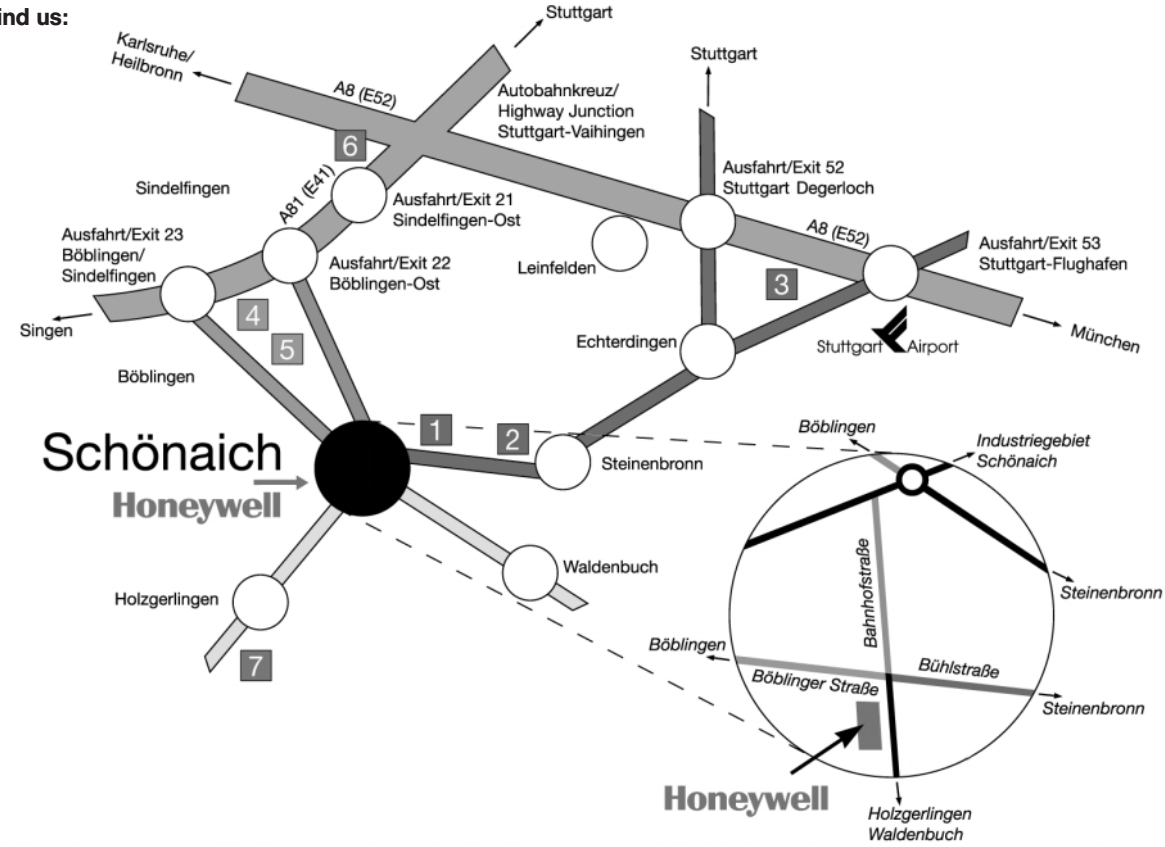
Featuring

Smart Press

Your connection to Fema

FEMA Schönaich		E-mail	Extension-Nr.
FEMA Controls	Honeywell AG Böblinger Strasse 17 D-71101 Schönaich	fema@honeywell.com	(49) 7031 637-02 Fax (49) 7031 637-850
Technical Questions	Jürgen Berner Robert Käshammer	Juergen.Berner@honeywell.com Robert.Kaeshammer@honeywell.com	(49) 7031 637-833 (49) 7031 637-824
Sales Support	Monika Klingler Ingrid Kirchenbauer Zeljka Tosic	Monika.Klingler@honeywell.com Ingrid.Kirchenbauer@honeywell.com Zeljka.Tosic@honeywell.com	(49) 7031 637-826 (49) 7031 637-817 (49) 7031 637-811
Customer Service	Selma Solmaz Zeljka Tosic	Selma.Solmaz@honeywell.com Zeljka.Tosic@honeywell.com	(49) 7031 637-813 (49) 7031 637-811
Product Management	Franz Lutz	Franz.Lutz@honeywell.com	(49) 7031 637-326

How to find us:



Fema Controls
Honeywell AG
Postfach 1254
71099 Schönaich
Böblinger Straße 17
71101 Schönaich
Phone (49) 7031 637-02
Fax (49) 07031 637-850
fema@honeywell.com
www.honeywell.de/fema

- (approx. 15 minutes)
  Freeway A81 direction Stuttgart/Böblingen. Take exit 23 “Böblingen-Sindelfingen”.
  Direction Böblingen to center (Zentrum). Follow the signs to “Nürtingen/Schönaich”.
- (approx. 10 minutes)
  Freeway A81. Take exit 22 “Böblingen-Ost”.Turn left on the first traffic light.
  Follow the signs to Schönaich. In the traffic circle take the first exit and follow the main road.
- To those, who are familiar with the area: Freeway A8 from direction Munich.
  Take exit 53 Stuttgart/Airport. Pass through Echterdingen/Steinenbronn to Schönaich.

New products

Electronic Pressure Switch PS, PST, PST…-R series

- Pressure range from –1…600 bar
- Relative and absolut pressure
- Process connections: G ½″ Standard Manometer
  G ¾″ Flush to the Front
- Fully configurable 2-channel
  Switch, optional analog output
  optional Relay output.
- Protection standard IP 65

16

Electronic Thermostats TS, TST, TST…-R series

- Temperature range from –50 °C…+400 °C
- housing-mounted and cable-mounted sensors
- Different sensor immersion lengths

Available September 2002

Compact Electronic Flow Switch KSW and KSL

…for monitoring Liquid and Air flow.

59/60

- Available in 230 VAC and 24 VAC/DC version
- Switching load 230 V, 10 (2) A
- Low power consumption
- No moving parts
- Sensing element and PCB in one unit
- Safety function (close off) in case of sensor defect

Frost Protection Thermostats Series T 69

…for Anti-Freeze Protection of heat exchangers in Air Handling Systems.

52

- different sensor lengths
- 1,8 m Version with immersion bulb
- IP 40 and IP 65 Versions available
- Dust-tight Honeywell Micro Switch inside
- High Switching capacity 15 (8) A, 250 VAC
- Adjustable temperature range –10 °C…+12 °C
- Mounting clamps package included

New products

Difference Pressure Transmitter Series DPT

…for filter and fan monitoring in Air Handling systems. 37

- Pressure range from –50 Pa up to 5000 Pa
- 0–10 V and 4–20 mA versions available
- Sensor type piezo-resistive

Single Stage Room & Duct Hygrostats H 6045 A and H 6120 A

…for monitoring humidity in air conditioning systems and climatic cabinets. 55

- Humidity range 35…100 % r. H.
- Single pole change over contact
- Cost-effective and reliable solution

Single- and Dual Stage Industrial Room Thermostats T 6120 A / B

…for measuring, controlling and monitoring temperatures in heating and cooling systems. 54

- Rigid and stable Copper and Stainless Steel sensor system
- Easy wiring and installing
- Dust-tight micro switches inside
- Glass fiber reinforced housing

Paddle Air and Liquid flow Switches S 6040 and S 6065 series

…for monitoring flow rates in pipes and ducts. 58

- Versions available for air, non-aggressive liquids and aggressive liquids
- High switching capacity 15 (8) A 250 VAC
- Working temperature –40 °C…+85 °C
- Protection standard IP 65
- Wide range of flow rates indicatable

Solenoid Valves Series AV

…TÜV approved according DIN EN 264. Prefered use in liquid fuel supply systems for heating boilers. 67

- Sizes from 10 up to 40 mm diameter
- Internal screw connections form G ⅜″ up to G 2″
- Internal sealing by VITON O-Ring
- Housing material Yellow Brass and Stainless Steel
- Pressure from –0,9 up to 4 (10) bar
- 230 V, 50 Hz, 8 VA, ED 100 %
- K_{VS} from 1.9 up to 30 m^3/h

Contents

Pressure Switches / Differential Pressure Switches (also Ex-versions)

Pressure and Differential Pressure Transmitters

LON-Products

High-Grade-Stainless-Steel Temperature Transmitters / Sensors

Thermostats (also Ex-versions)

Contents

Overview of available types

Replacement Overview

Pressure Switch

Old Type	New Type
DCMV 625	**DWR 625-203**
DNM 506	**DGM 506**
DNM 516	**DGM 516**
DNM 525	**DGM 525**
DNM 06	**DWR 06**
DNM 1	**DWR 1**
DNM 6	**DCM 6**
DNM 625	**DCM 625**
DNM 10	**DCM 10**
DNM 16	**DCM 16**
DNM 25	**DCM 25**
DNM 40	**DCM 40**
DNM 63	**DCM 63**
DNMV 025	**DNS 025-203**
DNMV 06	**DWR 06-203**
DNMV 1	**DWR 1-203**
DNMV 6	**DCMV 6**
DNMV 16	**DCMV 16**
DNMV 40	**DCMV 40**
DNMV 63	**DCMV 63**

Pressure Switch

Old Type	New Type
Ex-DCM 025	**Ex-DNS 025**
Ex-DCM 06	**Ex-DWR 06**
Ex-DCM 1	**Ex-DWR 1**
Ex-DNM 506	**Ex-DGM 506**
Ex-DNM 516	**Ex-DGM 516**
Ex-DNM 525	**Ex-DGM 525**
Ex-DNM 06	**Ex-DWR 06**
Ex-DNM 1	**Ex-DWR 1**
Ex-DNM 3	**Ex-DWR 3**
Ex-DNM 6	**Ex-DWR 6**
Ex-DNM 625	**Ex-DWR 625**
Ex-DNM 16	**Ex-DWR 16**
Ex-DNM 25	**Ex-DWR 25**
Ex-DNM 40	**Ex-DWR 40**

Pressure Transmitter

Old Type	New Type
FN 5 + ED 1	**SN 6-311**
FN 10 + ED 1	**SN 10-311**
FN 25 + ED 1	**SN 25-311**
FN 40 + ED 1	**SN 40-311**
FN 5 + ED 3	**SN 6-395**
FN 10 + ED 3	**SN 10-395**
FN 25 + ED 3	**SN 25-395**
FN 40 + ED 3	**SN 40-311**

Solenoid Valve

Old Type	*New Type*
AH 10	**AV102MS2**
AH 13	**AV131MS2**

Pressure units conversion table

Important notice:

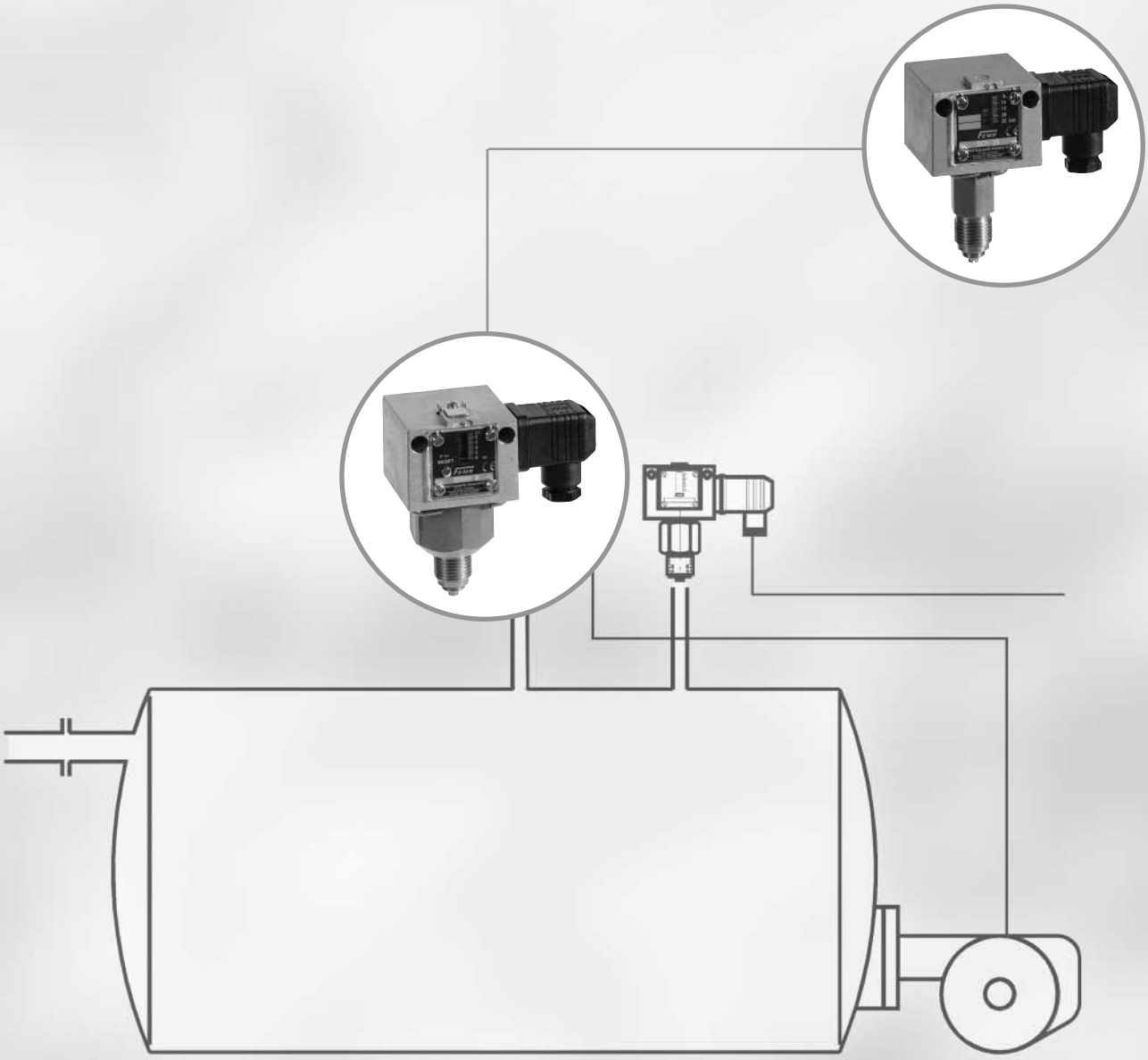
All the stated pressure levels are overpressure or vacuum compared to atmospheric pressure. Overpressure is marked with a plus sign, vacuum with a minus sign.

unit	bar	mbar	Pa	kPa	MPa	lb/in^2 (psi)
1 bar	1	1000	10^5	100	0.1	14.50
1 mbar	0.001	1	100	0.1	10^{-4}	0.0145
1 Pa	10^{-5}	0.01	1	0.001	10^{-6}	$1.45 \cdot 10^{-4}$
1 kPa	0.01	10	1000	1	0.001	0.145
1 MPa	10	10^4	10^6	1000	1	145

In all Fema-documents, the pressure is stated in bar, mbar or Pa.

Honeywell

Pressure Switches Application Guideline



Product Overview

The Fema Pressure Switch product portfolio provides devices suitable for many applications. The portfolio contains Special functions and equipment as well as approved devices for several kind of applications, where component-tested devices are mandatory.

All Sensors are tightness-tested with helium.

Following overview shows features and functions of Fema Pressure Switches.

Pressure Switches for standard applications

For Pressure monitoring and pressure controlling (ON/OFF controller). Pressure range from vacuum up to 63 bar overpressure. Series DCM…/DNM…/VCM…

Variants and types:

- Screw terminals instead of plug
- enhanced IP Protection
- Ex-versions available
- plastic-coated housing for aggressive environment
- 2-step switch
- different switching elements

Overpressure & Vacuum Switches in Stainless Steel

All medium contacted parts made of Stainless Steel 1.4571.
Variants & types according to above sections are possible.
Pressure range from vacuum up to 16 bar.

Pressure Monitor and Pressure Limited

for Steam, Hot Water, Fuel gases, Liquid gases and Fuel Oil
with all necessary component tests according to TÜV, DVGW, DIN.
Pressure range up to 40 bar.
Type series DA; DWR…/DGM…

Pressure Limiter featuring Safety Technology

Wherever there is a demand for high safety level monitoring supply line breaks and short circuits.

- together with Ex 041 Switching amplifier for EEx-i-applications suitable
- With plastic-coated housing suitable for chemical applications
- Pressure range up to 40 bar, type series DBS…

Variants and types

- self-monitoring sensor
- gold contacts for EEx-i versions
- constrained-opened microswitch

Differential Pressure Monitors

Differential Pressure Monitors to control the difference between 2 measuring points. Mostly used for monitoring filter and pump function. Available types for measuring differential pressure in liquid flow systems, as well as air flow applications.
Differential Pressure Switch types available up to 16 bar.

Info

10 criteria to observe in the selection of a pressure monitor / pressure limiter

C H E C K L I S T

Medium	Steam, hot water, fuel gases, air, flue gases, liquefied gas, liquid fuels, other media
Sensor material	Stainless steel, non-ferrous metals, plastics (e. g. Perbunan). Are all sensor materials resistant to the medium? Oil- and grease-free for oxygen?
Type approval	Is a type approval (TÜV, DVGW, PTB, etc.) required for the intended application?
Function	Monitor, limiter (with internal or external interlock). Pressure limiter in safety engineering?
Direction of action	Should the maximum pressure or the minimum pressure be monitored? Does the pressure switch have a controller function (e. g. pump on and off)?
Setting range	Select the desired setting range from the type overviews.
Switching difference Only for controllers/monitors	The adjustable switching difference is important only for pressure switches with controller function. The switching differential (hysteresis) has no significance for limiter functions.
Max. permissible operating pressure	The maximum permissible operating pressure listed in the tables must be equal or greater than the maximum system pressure.
Ambient conditions	Medium temperature / ambient temperature / type of protection / humidity / Ex zone / Outdoor installation – protective measures
Design / Size Pressure connection	Size, installation position, installation possibility, pressure connection with gasket.
Electric data Switching capacity	Switching element / change-over contact / normally closed contact / normally open contact / switching capacity / interlocking / gold contacts / contactless signal transmission.

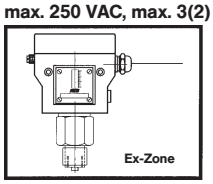
This list of criteria does not claim to be complete.
However, all items must be checked. The stated sequence is expedient but not mandatory.

Info

Pressure monitoring in explosion-endangered areas

Pressure switches with special equipment can also be used in the **Ex area Zone 1 and 2**.
The following alternatives are possible:

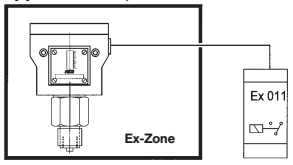
max. 250 VAC, max. 3(2) A



1. Pressure switch with pressure-proof encapsulated switching device, degree of protection EEx de IIC T6

The pressure switch in pressure-proof encapsulation can be used directly in the Ex area (Zone 1 and 2). Maximum switching voltage, switching capacity, and ambient temperature must be taken into account and the rules for the installation in the Ex area must be observed. All pressure switches can be equipped with Ex switching mechanisms. Special circuits as well as versions with adjustable switching differences are not possible.

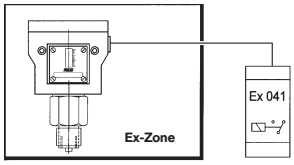
approx. 8 VDC, max. 8 mA



2. Pressure switches in EEx-i-version

All pressure switches in normal version can be used in the Ex area Zone 1 and 2, if they are incorporated in an “intrinsically safe circuit”. In principle, the intrinsic safety is based on, that fact that the control circuit run in the Ex area carries only a small amount of energy, which is not able to generate ignitable sparks.
Isolating switching amplifiers, e. g. Type Ex 011 or Ex 041 must be tested by the PTB and approved for Ex-installations. Isolating switching amplifiers must in any event be installed outside the Ex zone.
Pressure switches which are intended for EEx-ia installations can be equipped with blue terminals and cable entries. Because of the low voltages and currents which are carried by the contacts of the microswitch, gold plated contacts are recommended (optional function ZF 513).

approx. 8 VDC, max. 8 mA



3. Pressure switches with microswitch and series resistor for wire breakage and short circuit monitoring

A combination of pressure switch with mechanical microswitch connected with a 1.5 k series resistor and a 10 k parallel resistor and an isolating switching amplifier in safety technology (Type Ex 041) can also be used for Ex zone 1 and 2 (degree of protection EEx-ia). The isolating switching amplifier in safety technology generates an intrinsically safe control circuit and simultaneously monitors the supply line between the isolating switching amplifier and pressure switch for short circuit and line break.
Please refer to the chapter on pressure switches in safety technology and data sheet Ex 041.

Pressure monitoring in Ex areas Zone 1 and 2

Ex-D…

Flameproof enclosed

Ignition protection type:
EEx de IIC T6

PTB approval for the complete switchgear

Switching capacity
at 230 V / 3 A.

The pressure switch can be installed inside the Ex zone.

ATEX-approval for gas and dust in preparation.

D…-513 + Ex 011

Intrinsically safe

Ignition protection type:
EEx-ia

PTB approval for isolation switching amplifiers Ex 011.

Pressure switches with gold-plated contacts, blue terminals and blue cable entries.

The isolation switching amplifier must be installed outside the Ex zone.

DWAM…-576 + Ex 041

Instrinsically safe, line break and short circuit monitoring
Ignition protection type:
EEx-ia

PTB approval for isolation switching amplifiers Ex 041.

Pressure switches with safety sensor, forced opening micro-switch, gold-plated contacts blue terminals and blue cable entries.

The isolation switching amplifier must be installed outside the Ex zone.

Info

Switch housings for pressure switches

IP 54

IP 65

IP 65

The switching housings consists of high quality and seawater-resistant aluminium diecastings. Three versions are available:

Housing 200 (normal version)
Plug connection to DIN 43650
Degree of protection IP 54
Setpoint setting accessible from the outside.

Housing 300
With terminal connection box
Degree of protection IP 65
Setpoint setting and terminal connections accessible
only after removal of the terminal box lid.

Housing 700 (EEx-d-version)
All pressure and differential pressure switches can be equiped with these switching housings and are thus approved for Ex zones 1 + 2.
Degree of protection IP 65.
Ex degree of protection EEx de IIC T6.

Component tests

Special type series have been developed for special applications in the safety area:

VdTÜV
Pressure 100 / 1

Steam and hot water (Series DWR and DA)
Pressure monitors and pressure limiters for steam and hot water in systems to DIN 4751 P2 and TRD 604.

DVGW
DIN 3398 P.1 and P.3
DIN EN 1854

Fuel gases CE (Series DGM and DWR)
Pressure monitors and limiters for fuel gases in accordance with DVGW Worksheet G 260.

TÜV
DIN 3398 P.4

Liquid fuels (Series DWR)
Pressure monitors and pressure limiters for liquid fuels (heating oil).

TÜV
Pressure 100/1
(DIN 3398 P.3 and P.4)

Pressure limiters in safety engineering
for safety-relevant pressure monitoring in liquid gas systems, chemical and processing engineering systems.

EEx de IIC T6
(pressure proof encapsulated)

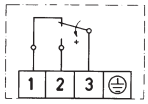
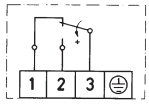
Ex-versions
For Ex-areas Zone 1 + 2, all pressure switches can be delivered in pressure-proof encapsulated design (Ex-degree of protection EEx de IIC T6). PTB approval: Ex-90.C.1059.
ATEX-approval for gas and dust in preparation.

EEx-ia
(intrinsically safe)

For intrinsically safe control circuits (Ex-degree of protection EEx-ia), the pressure switches can be delivered with gold contacts, EEx-ia as well as with the blue terminals and cable entries customary in the EEx-ia area.
An isolating switching amplifier, which transfers the control commands of the pressure switch from an instrinsically safety control circuit (EEx-ia) into a non-intrinsically safe active circuit, is required in addition to the pressure switch.
ATEX-approval for gas and dust in preparation.

Technical overview pressure switches

Valid for all pressure switch with microswitches of the DCM, VCM, DNM, DNS, DDC series. The technical data of the component tested units deviate in part slightly. (Please refer to type sheet)

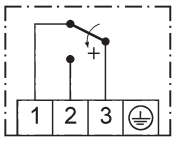
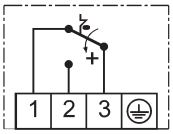
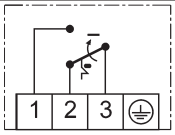
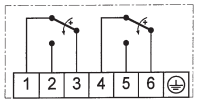
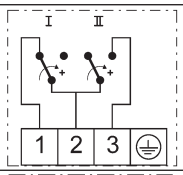
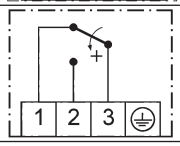
	Normal version **Plug connection**  **…200**	**Terminal connection**  **…300**	**Ex -version** **ATEX-approval for gas and dust in preparation.**  **…700**
Switching device	Aluminium diecast GD Al Si 12		Aluminium diecast GD Al Si 12
Pressure connection	G ½″ external thread (pressure gauge connection) and G ¼″ internal thread. Internal thread G ¼ at differential pressure switches DDCM.		G ½″ external thread (pressure gauge connection) and G ¼″ internal thread. Internal thread G ¼″ at differential pressure switches DDCM.
Switching function and connection drawing (applies only for version with microswitch)	Floating change-over contact. With rising pressure switching over single-pole from 3–1 to 3–2 		Floating change-over contact. With rising pressure switching over single-pole from 3–1 to 3–2 
Switching capacity (applies only for version with microswitch)	8 A at 250 VAC 5 A at 250 VAC inductive 8 A at 24 VDC 0.3 A at 250 VDC		3 A at 250 VAC 2 A at 250 VAC inductive 3 A at 24 VDC 0.03 A at 250 VDC
Fitting position	arbitrary, preferably vertical (see data sheet)		vertical
Degree of protection (in vertical position)	IP 54, Terminal connection IP 65		IP 65
Ex degree of protection	–		EEx de IIC T6 tested according to EN 50014 / 50018 / 50019 (CENELEC)
PTB approval	–		Ex-90.C.1059
Electrical connection	200 series: Plug connection 300 series: Terminal connection		Terminal connection
Cable entry plug	Pg 11		
Cable entry terminal connection	M 16 x 1,5		M 16 x 1,5
Ambient temperature	-25 to +70 °C. (with the exception of DA-series –20…+70 °C and DCM 4016, 4025, 1000, VCM 4156)		-15 to +60 °C
Switching point	Adjustable on the spindle. In switching mechanism 300, the terminal box lid must be removed.		Adjustable on the spindle after the terminal box lid is removed.
Switching difference	Adjustable or not adjustable (see type overview)		Not adjustable
Medium temperature	Max. 70 °C, briefly 85 °C		Max. 60 °C
	Higher medium temperatures are possible if the above limit values at the switching mechanism are ensured by suitable measures (e. g. siphon).		

Vacuum	All pressure switches can operate under vacuum, the device is not damaged by this.
Repetition accuracy of the switching points	< 1 % of the working range (for pressure ranges > 1 bar)
Vibration strength	Up to 4 g no noteworthy deviations.
Mechanical life	With sinusoidal pressure application and room temperature, 10 x 10^6 switching cycles. The expected life time depends strongly upon the type of pressure application, therefore this figure can serve only as rough estimate. With pulsating pressure or pressure impacts in hydraulic systems, pressure surge reduction is recommended.
Isolation values	Overvoltage category III, contamination class 3, reference surge voltage 4000 V. The conformity to DIN VDE 0110 (01.89) will be confirmed.
Oil and grease-free	The parts of all pressure switches in contact with the medium are oil and grease-free (with the exception of series HCD… und DPS…). The sensors are hermetically encapsulated, they contain no seals (see also additional function ZF 1979, special packing).

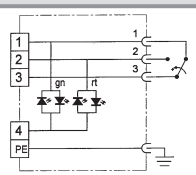
Optional function ZF

Pressure Switches and Pressure Monitors

Optional function / connection diagrams

	Plug connection Series 200 (IP 54)	*Terminal connection Series 300 (IP 65)*	*Connection diagrams*	*Explanation*
Normal version (plug connection) microswitch, single pole switching over, switching differential not adjustable.				
Terminal connection housing (Series 300)		**…301**		
Adjustment of switching difference	**…V or …203**			**see following pages**
Maximum limiter with reclosing lock-out. **Interlocking with increasing pressure.** see DWR-series	**…205**			**see DWR-series 29**
Minimum limiter with reclosing lock-out. **Interlocking with falling pressure.** see DWR-series	**…206**			**see DWR-series 29**
Two microswitches, switching in parallel or in succession. Fixed switching interval. Terminal connection case. **Please state circuit diagram.** (not possible on every pressure switch)		**…307**		
Two microswitches, 1 plug switching in succession, adjustable switching interval. **Please state circuit diagram.** (not possible on every pressure switch)	**…217**			
Gold-plated contacts Single pole switching over. Cannot be supplied with adjustable switching difference.	**…213**			Switching capacity: max. 24 VDC, 100 mA min. 5 VDC, 2 mA

Switching units / optional functions / Adjustment / Documents

Description	*Plug connection Series 200 (IP 54)* 	*Terminal connection Series 300 (IP 65)* 	*Connection diagrams*
Plug connector with position indication 12 V–240 VAC / DC	**ST 218**		
Protection type IP 65 and switching **housing with surface protection** (Chemical version)		**…351**	

Example:

DCM 6 – 205
- 205 — Code of switching unit (e.g. maximum limiter)
- 6 — Code of pressure range
- DCM — Sensor system

Ordering text:
Pressure switch
DCM 6 – 205
or DCM 6 with ZF 205

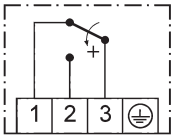
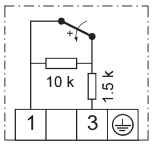
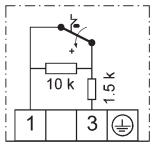
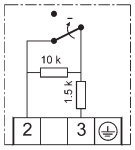
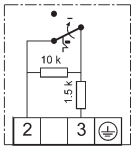
Optional function ZF

Pressure Switches and Pressure Monitors

Optional function for EEx-i equipment ZF 5…

- Housing (300) with terminal connection (IP 65), blue cable entry and blue terminals.
- Partially with resistance combination for line breakage and short circuit monitoring (with isolating switching amplifier Ex 041).

Important:
All pressure switches with the optional functions listed here can be operated only together with a suitable isolating switch amplifier.

Optional function in EEx-i equipment	*Type*	*Connection diagram*	*Isolating switching amplifier*
Gold-plated contacts, single-pole switch-over. Switching differential permanent (not adjustable). **Switching capacity:** max. 24 VDC, 100 mA, min. 5 VDC, 2 mA	**…513**		**EX 011**
Normally closed contact with resistance combination, for **maximum pressure monitoring.** Gold-plated contacts. **Housing with surface protection.** (Chemical version)	**…576**		**EX 041**
Normally closed contact with reclosing lock-out and resistance combination, for **maximum pressure monitoring.** **Housing with surface protection.** (Chemical version)	**…577**		**EX 041**
Normally closed contact with resistant combination for **minimum pressure monitoring.** Gold-plated contacts. **Housing with surface protection.** (Chemical version)	**…574**		**EX 041**
Normally closed contact with reclosing lock-out and resistance combination, for **minimum pressure monitoring.** **Housing with surface protection.** (Chemical version)	**…575**		**EX 041**

Additional optional functions	*Plug connection* ***Reihe 200***	*Terminal connection* ***Reihe 300***
Adjustment according to customer's instruction:		
one switching point	**…1970***	**…1970***
two switching points or defined switching differential	**…1972***	**…1972***
Adjustment and sealing according to customer's instruction:		
one switching point	**…1971***	**–**
two switching points or defined switching differential	**…1973***	**–**
Certification for Helium tightening test	**…1977**	**…1977**
Label of units according to customer's instruction	**…1978**	**…1978**
Special packing for oil and grease-free storage	**…1979**	**…1979**
Documents: additional documents, e. g. data sheets, mounting instructions, TÜV-, DVGW- or PTB-certificate.	**DOKU**	**DOKU**
Certificates according to EN 10 204 Test report 2.2, type series certificate	**WZ 2.2**	**WZ 2.2**
AZ 3.1 B Inspection certificate, specific product test	**AZ 3.1 B**	**AZ 3.1 B**
Inspection certificate for separating membranes FV	**AZ 3.1 B–V**	**AZ 3.1 B–V**

* Switching point adjustment: please specify switching point **and** direction of action (rising or falling pressure).

Honeywell

Pressure Switches for Standard Applications

Smart Press – new electronic pressure Switches

Electronic Pressure Switch PS, PST, PST…-R series

All types available in PS, PST and PST…-R version according following description:

PS = **P**ressure **S**witch
PST = **P**ressure **S**witch + **T**ransmitter
PST…-R = **P**ressure **S**witch + **T**ransmitter + **R**elais

01 = -1..+1 bar
002 = 0–1.6 bar
004 = 0–4 bar
010 = 0–10 bar
025 = 0–25 bar
060 = 0–60 bar
100 = 0–100 bar
250 = 0–250 bar
600 = 0–600 bar

G12S = **G ½" S**tandard manometer version
G34F = **G ¾"** quasi-**F**lush version

PST **V** **01** **R** **G34F** **-R**

V = **V**acuum version

R = **R**elative pressure sensor version
A = **A**bsolute pressure sensor version

-R = switching channel 1 galvanically separated in relay version

Type overview

Pressure range in bar	*Max. all. pressure (bar)*	*Smart Press with 2 open collector outputs*	*Smart Press with 2 open collector outputs + analog output*	*Smart Press with 2 open collector outputs + analog output + relay output*	*Pressure range (bar)*
–1…+1	6	**PSV01RG12S**	**PSTV01RG12S**	**PSTV01RG12S-R**	–1…+1
0 – 1.6	6	**PS002RG12S**	**PST002RG12S**	**PST002RG12S-R**	0…1.6
0 – 4	12	**PS004RG12S**	**PST004RG12S**	**PST004RG12S-R**	0…4
0 – 10	30	**PS010RG12S**	**PST010RG12S**	**PST010RG12S-R**	0…10
0 – 25	75	**PS025RG12S**	**PST025RG12S**	**PST025RG12S-R**	0…25
0 – 60	180	**PS060RG12S**	**PST060RG12S**	**PST060RG12S-R**	0…60
0 – 100	300	**PS100RG12S**	**PST100RG12S**	**PST100RG12S-R**	0…100
0 – 250	500	**PS250RG12S**	**PST250RG12S**	**PST250RG12S-R**	0…250
0 – 600	1000	**PS600RG12S**	**PST600RG12S**	**PST600RG12S-R**	0…600
–1…+1	6	**PSV01RG34F**	**PSTV01RG34F**	**PSTV01RG34F-R**	–1…+1
0 – 1.6	6	**PS002RG34F**	**PST002RG34F**	**PST002RG34F-R**	0…1.6
0 – 4	12	**PS004RG34F**	**PST004RG34F**	**PST004RG34F-R**	0…4
0 – 10	30	**PS010RG34F**	**PST010RG34F**	**PST010RG34F-R**	0…10
0 – 25	75	**PS025RG34F**	**PST025RG34F**	**PST025RG34F-R**	0…25
0 – 2	6	**PS002AG12S**	**PST002AG12S**	**PST002AG12S-R**	0…2
0 – 10	30	**PS010AG12S**	**PST010AG12S**	**PST010AG12S-R**	0…10
0 – 2	6	**PS002AG34F**	**PST002AG34F**	**PST002AG34F-R**	0…2
0 – 10	30	**PS010AG34F**	**PST010AG34F**	**PST010AG34F-R**	0…10

Accessories Smart Press

Connectors for plug 1 + 2 (OC and analog outputs):

ST 12-5-G	5-prong M12 plug connector, straight version
ST 12-5-A	5-prong M12 plug connector, angled version

Connectors for plug 3 (Relay output):

ST 12-4-G	4-prong M12 plug connector, straight version
ST 12-4-A	4-prong M12 plug connector, angled version
ST 12-4-GK	4-prong M12 plug connector, straight version with 2 m cable
ST 12-4-AK	4-prong M12 plug connector, angled version with 2 m cable

Plug protection cap:

STA 12	IP 65

Type series PS…, PST…, PST…-R

Product data

Application

Honeywell Fema's PS, PST and PST…-R series Electronic Pressure Switches require adjustment (configuration and parameterization) in only two modes (the basic mode and the expert mode) and are suitable for an extremely wide range of applications, including the precision-adjustment and monitoring of system pressures in the field of plant construction, fluidics, process technology, and pneumatics, as well as in the monitoring and control of pumps and compressors.
Those versions equipped for self-monitoring are suitable for use in manufacturing lines in the automotive industry as well as in the area of machine tool construction. These switches provide sufficient accuracy (0.5 % of final value) for measurement monitoring in many laboratory applications.

Technical data

Housing and back:	polybutylene terephtalate (PBT)
Max. ambient temp.:	–20…+60 °C
Storage temperature:	–35…+80 °C
Temperature, medium:	–20…+100 °C
Relative air humidity:	0…95 %, non-condensing
Accuracy, total:	0.5 % of final value
Total weight:	380 grams
Parts in contact with medium	
High-pressure versions	1.4571 + 1.4542
Low-pressure / flush	1.4571 + 1.4435
Process connection	
Manometer connection	G ½″ external thread
Flush connection	G ¾″ external thread
Electrical connection	
PS and PST versions	5-prong M12 plug, A-coded as per DIN IEC 60947-5-2
PST…-R version	Extra 3-prong M 12 plug
Protection class	II as per EN 60529
Climate class	C as per DIN IEC 60654
Power supply	14…36 VDC, max. 100 mA
EMC	compatible as per EN 61326/A1
Switch outputs (all versions)	
Open-Collector outputs	Two, high/low-side, configurable, max. 250 mA / 14…36 VDC
Reaction time	30 ms
Switching difference	(SP and RP) configurable
Relay outputs (PST…-R series)	
Contact type	1 switch-over contact
Min. electrical lifetime	250,000 switching cycles
Switching performance, gold contacts ($AgSn0_2$+Au)	
AC1 (resistive)	1.5 VA (24 VDC / 60 mA, 230 VAC / 6.5 mA)
AC15 (inductive)	unsuitable)
Max. switch-on current	60 mA for < 5 ms
Min. switching perf.	50 mW (either > 5 V or > 2 mA)
Switching performance, silver contacts ($AgSn0_2$)	
AC1 (resistive)	690 VA (230 VAC / 3 A)
AC15 (inductive)	230 VA (230 VAC / 1 A)
Max. switch-on current	30 A for < 5 ms
Min. switching perf.	500 mW (> 12 V or > 10 mA)
Diagnostic output	
Output configuration	warning output (plug 2), max. 20 mA, 14…36 VDC
Transmitter output (analog output)	
Voltage / current	0…10 V and 4…20 mA, configurable in expert mode
Transient response	approx. 300 ms

Type series DCM

Pressure switches for monitoring and control

DCM 025

DCM 25

for non-aggressive liquid and gaseous media

Range of adjustment	Switching difference (Mean value)	Max. allowable pressure	Materials*	Type
Switching difference not adjustable				
1 – 16 mbar	2 mbar	1 bar	NBR	**DCM 4016**
4 – 25 mbar	2 mbar	1 bar	+ 1.4301	**DCM 4025**
10 – 100 mbar	12 mbar	10 bar	NBR + Ms	**DCM 1000**
0.04 – 0.25 bar	0.03 bar	6 bar	Cu + Ms	**DCM 025**
0.1 – 0.6 bar	0.04 bar	6 bar	Cu + Ms	**DCM 06**
0.2 – 1.6 bar	0.04 bar	6 bar	Cu + Ms	**DCM 1**
0.2 – 2.5 bar	0.1 bar	16 bar		**DCM 3**
0.5 – 6 bar	0.15 bar	16 bar	Sensor-*	**DCM 6**
0.5 – 6 bar	0.25 bar	25 bar	housing	**DCM 625**
1 – 10 bar	0.3 bar	25 bar	1.4104	**DCM 10**
3 – 16 bar	0.5 bar	25 bar	Pressure	**DCM 16**
4 – 25 bar	1.0 bar	60 bar	bellow	**DCM 25**
8 – 40 bar	1.3 bar	60 bar	1.4571	**DCM 40**
16 – 63 bar	2.0 bar	130 bar		**DCM 63**

* Stainless steel 1.4104 ≈ AISI 430 F. High grade stainless steel 1.4571 ≈ AISI 316 Ti.

DCM 1000: NBR membrane + Brass (sensor housing)
Cu + Ms: Copper (bellow) + Brass (sensor housing)
NBR: Buna rubber

DCM 4016

Switching difference adjustable

0.04 – 0.25 bar	0.03 – 0.4 bar	6 bar	Cu + Ms	**DCMV**	**025**
0.1 – 0.6 bar	0.04 – 0.5 bar	6 bar	Cu + Ms	**DCMV**	**06**
0.2 – 1.6 bar	0.07 – 0.55 bar	6 bar	Cu + Ms	**DCMV**	**1**
0.2 – 2.5 bar	0.15 – 1.5 bar	16 bar	Sensor-	**DCMV**	**3**
0.5 – 6 bar	0.25 – 2.0 bar	16 bar	housing	**DCMV**	**6**
1 – 10 bar	0.5 – 2.8 bar	25 bar	1.4104	**DCMV**	**10**
3 – 16 bar	0.7 – 3.5 bar	25 bar	Pressure	**DCMV**	**16**
4 – 25 bar	1.3 – 6.0 bar	60 bar	bellow	**DCMV**	**25**
8 – 40 bar	2.6 – 6.6 bar	60 bar	1.4571	**DCMV**	**40**
16 – 63 bar	3.0 – 10 bar	130 bar		**DCMV**	**63**

Cu + Ms = Copper (bellow) + Brass (sensor housing)

(Ex) -version · Degree of protection EEx de IIC T6

Range of adjustment	Switching difference (Mean value)	Max. allowable pressure	Materials*	Type
Switching difference not adjustable				
1 – 16 mbar	2 mbar	1 bar	NBR	**Ex-DCM 4016**
4 – 25 mbar	2 mbar	1 bar	NBR	**Ex-DCM 4025**

Further pressure ranges in Ex-series see following pages.

Type series DNM

Pressure switches with sensor system in stainless steel version

DNM 025

All parts of the DNM series of Fema pressure switches which come into contact with the medium are made of stainless steel. The pressure sensor is welded without added material.

Range of adjustment	*Switching difference (Mean value)*	*Max. allowable pressure*	*Materials*	*Type*
Switching difference not adjustable				
0.04 – 0.25 bar	0.03 bar	6 bar	1.4104 + 1.4571	**DNM 025**

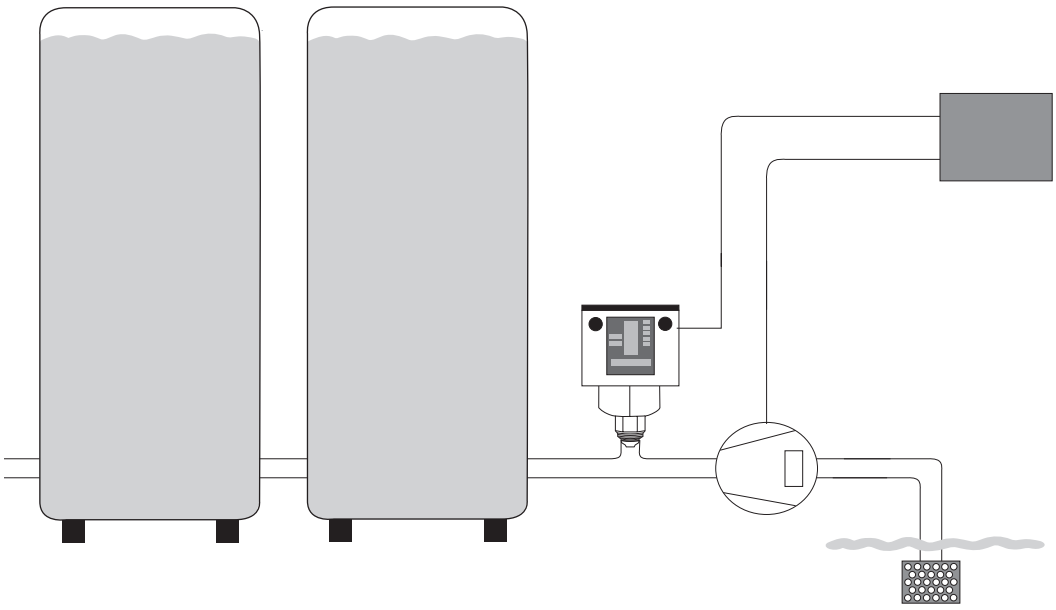
Ex-DNM 10

-version · Degree of protection EEx de IIC T6

Range of adjustment	*Switching difference (Mean value)*	*Max. allowable pressure*	*Materials*	*Type*
Switching difference not adjustable				
1 – 10 bar	0.15 bar	16 bar	1.4104 + 1.4571	**Ex-DNM 10**
16 – 63 bar	1.0 bar	130 bar		**Ex-DNM 63**

Application

Fema pressure switches to control a minimum pressure value by switching on/off a supply pump.
Level control in a cooling system.



Type series DNS/VNS

Pressure and vacuum switches

with high-grade stainless steel sensor system 1.4571

All sensor parts connected to the media are made of stainless steel 1.4571.

DNS 1-201

Range of adjustment	Switching diff. (Mean value)	Max. allowable pressure	Type
Switching difference not adjustable			
-250/+100 mbar	45 mbar	3 bar	**VNS 301–201**
-1*/+0.1 bar	50 mbar	6 bar	**VNS 111–201**
0.04 – 0.25 bar	30 mbar	6 bar	**DNS 025–201**
0.1 – 0.6 bar	40 mbar	6 bar	**DNS 06–201**
0.2 – 1.6 bar	60 mbar	6 bar	**DNS 1–201**
0.2 – 2.5 bar	0.1 bar	16 bar	**DNS 3–201**
0.5 – 6 bar	0.15 bar	16 bar	**DNS 6–201**
1 – 10 bar	0.3 bar	16 bar	**DNS 10–201**
3 – 16 bar	0.5 bar	25 bar	**DNS 16–201**
Switching difference adjustable			
-250/+100 mbar	70 – 300 mbar	3 bar	**VNS 301–203**
-1*/+0.1 bar	90 – 550 mbar	6 bar	**VNS 111–203**
0.04 – 0.25 bar	60 – 300 mbar	6 bar	**DNS 025–203**
0.1 – 0.6 bar	80 – 400 mbar	6 bar	**DNS 06–203**
0.2 – 1.6 bar	100 – 600 mbar	6 bar	**DNS 1–203**
0.2 – 2.5 bar	0.15 – 1.5 bar	16 bar	**DNS 3–203**
0.5 – 6 bar	0.25 – 2.0 bar	16 bar	**DNS 6–203**
1 – 10 bar	0.45 – 2.5 bar	16 bar	**DNS 10–203**
3 – 16 bar	0.8 – 3.5 bar	25 bar	**DNS 16–203**

Chemical version (housing with surface protection)

Housing with high-grade stainless steel system (1.4571). Degree of protection IP 65.

DNS 1-351

Range of adjustment	Switching diff. (Mean value)	Max. allowable pressure	Type
Switching difference not adjustable			
-250/+100 mbar	45 mbar	3 bar	**VNS 301–351**
-1*/+0.1 bar	50 mbar	6 bar	**VNS 111–351**
0.04 – 0.25 bar	30 mbar	6 bar	**DNS 025–351**
0.1 – 0.6 bar	40 mbar	6 bar	**DNS 06–351**
0.2 – 1.6 bar	60 mbar	6 bar	**DNS 1–351**
0.2 – 2.5 bar	0.1 bar	16 bar	**DNS 3–351**
0.5 – 6 bar	0.15 bar	16 bar	**DNS 6–351**
1 – 10 bar	0.3 bar	16 bar	**DNS 10–351**
3 – 16 bar	0.5 bar	25 bar	**DNS 16–351**

* In the case of very high vacuum, close to the negative pressure of -1bar which is only theoretically possible, the switch can be adjusted only with reservations on account of the special conditions of vacuum technology. The pressure switch itself will however not be damaged at maximum negative pressure.

-version · Degree of protection EEx de IIC T6

Ex-DNS 3

Range of adjustment	Switching diff. (Mean value)	Max. allowable pressure	Type
Switching difference not adjustable			
-250/+100 mbar	45 mbar	3 bar	**Ex-VNS 301**
-1*/+0.1 bar	50 mbar	6 bar	**Ex-VNS 111**
0.04 – 0.25 bar	30 mbar	6 bar	**Ex-DNS 025**
0.1 – 0.6 bar	40 mbar	6 bar	**Ex-DNS 06**
0.2 – 1.6 bar	60 mbar	6 bar	**Ex-DNS 1**
0.2 – 2.5 bar	0.1 bar	16 bar	**Ex-DNS 3**
0.5 – 6 bar	0.15 bar	16 bar	**Ex-DNS 6**
1 – 10 bar	0.3 bar	16 bar	**Ex-DNS 10**
3 – 16 bar	0.5 bar	25 bar	**Ex-DNS 16**

Type series VCM

Negative Pressure Switches (Vacuum Switch)

The Fema Negative Pressure Switches detect the pressure difference relative to the atmospheric pressure. All data on switching pressure ranges and therefore also the scale divisions on the switch units are to be understood as the difference in pressure between the atmospheric pressure at any one time and the set switching pressure. The “zero” reference point on the scale of the unit corresponds to the atmospheric pressure at the time.

VCM 301

VNM 111

Range of adjustment	*Switching difference (Mean value)*	*Max. allowable pressure*	*Materials**	*Type*
Switching difference not adjustable				
-15 / + 6 mbar	2 mbar	1 bar	Perbunan	**VCM 4156**
-250 / + 100 mbar	25 mbar	1.5 bar	Cu + Ms	**VCM 301**
-1*/ + 0.1 bar	45 mbar	3 bar	Cu + Ms	**VCM 101**
-0.9/ + 0.5 bar	50 mbar	3 bar	Cu + Ms	**VCM 095**
-250 / + 100 mbar	45 mbar	3 bar	1.4104	**VNM 301**
-1*/ + 0.1 bar	50 mbar	6 bar	1.4104	**VNM 111**
Switching difference adjustable				
-250 / + 100 mbar	30 – 200 mbar	1.5 bar	Cu + Ms	**VCMV 301**
-1*/ + 0.1 bar	80 – 350 mbar	3 bar	Cu + Ms	**VCMV 101**
-0.9/ + 0.5 bar	90 – 400 mbar	3 bar	Cu + Ms	**VCMV 095**
-250 / + 100 mbar	70 – 450 mbar	3 bar	1.4104	**VNMV 301**
-1*/ + 0.1 bar	90 – 650 mbar	6 bar	1.4104	**VNMV 111**

* Stainless steel 1.4104 ≈ AISI 430 F. High grade stainless steel 1.4571 ≈ AISI 316 Ti.

DCM 1000: NBR membrane + Brass (sensor housing)
Cu + Ms: Copper (bellow) + Brass (sensor housing)
NBR: Buna rubber

Ex -version · Degree of protection EEx de IIC T6

Range of adjustment	*Switching difference (Mean value)*	*Max. allowable pressure*	*Materials**	*Type*
Switching difference not adjustable				
-15 / + 6 mbar	2 mbar	1 bar	Perbunan	**Ex-VCM 4156**
-250 / + 100 mbar	25 mbar	1.5 bar	Cu + Ms	**Ex-VCM 301**
-250 / + 100 mbar	45 mbar	3 bar	1.4104	**Ex-VNM 301**
-1*/ + 0.1 bar	45 mbar	3 bar	Cu + Ms	**Ex-VCM 101**
-0.9/ + 0.5 bar	50 mbar	3 bar	Cu + Ms	**Ex-VCM 095**
-1*/ + 0.1 bar	50 mbar	6 bar	1.4104	**Ex-VNM 111**
-250 / + 100 mbar	45 mbar	3 bar	1.4571	**Ex-VNS 301**
-1*/ + 0.1 bar	50 mbar	6 bar	1.4571	**Ex-VNS 111**

*In the case of very high vacuum, close to the negative pressure of –1 bar which is only theoretically possible, the switch can be adjusted only with reservations on account of the special conditions of vacuum technology. The pressure switch itself will however not be damaged at maximum negative pressure.

Type series DDC

Differential Pressure Switches

for liquid and gaseous media (e. g. for hot/cold water, steam and gas)

The Fema differential pressure switches are suitable for monitoring differential pressures, flow monitoring and automatic checking of filter plants. A double chamber system with stainless steel bellows resp. perbunan diaphragm accurately detects the difference between the two applied pressures. The differential pressure to be monitored is adjustable within the ranges mentioned in the summary of types. The DDCM differential pressure switches can also be used in vaccum.
The switching difference is not adjustable.

DDCM 252

Range of adjustment (differential pressure)	*Switching diff. (Mean value)*	*Max.** allowable pressure*	*Material*	*Type*
4 – 25 mbar	2 mbar	0.5 bar		**DDCM 252***
10 – 60 mbar	15 mbar	1.5 bar	Aluminium	**DDCM 662***
20 – 160 mbar	20 mbar	3 bar	+ Perbunan	**DDCM 1602***
100 – 600 mbar	35 mbar	3 bar		**DDCM 6002***
–0.1 – 0.4 bar	0.15 bar	15 bar		**DDCM 014***
0.2 – 1.6 bar	0.13 bar	15 bar	Stainless steel	**DDCM 1**
1 – 4 bar	0.2 bar	25 bar	1.4305 +	**DDCM 4***
0.5 – 6 bar	0.2 bar	15 bar	1.4571	**DDCM 6**
3 – 16 bar	0.6 bar	25 bar		**DDCM 16**

Further differential Pressure Switches see DPS- and HCD-series.
Accessories see VKD …, page 71, and MAU 8 …, page 72.

Ex-DDCM 1

-version · Degree of protection EEx de IIC T6

Range of adjustment (differential pressure)	*Switching diff. (Mean value)*	*Max.** allowable pressure*	*Material*	*Type*
4 – 25 mbar	2 mbar	0.5 bar		**Ex-DDCM 252***
10 – 60 mbar	15 mbar	1.5 bar	Aluminium	**Ex-DDCM 662***
20 – 160 mbar	20 mbar	3 bar	+ Perbunan	**Ex-DDCM 1602***
100 – 600 mbar	35 mbar	3 bar		**Ex-DDCM 6002***
-0.1 – 0.4 bar	0.15 bar	15 bar		**Ex-DDCM 014***
0.2 – 1.6 bar	0.13 bar	15 bar	Stainless steel	**Ex-DDCM 1**
1 – 4 bar	0.2 bar	25 bar	1.4305 +	**Ex-DDCM 4***
0.5 – 6 bar	0.2 bar	15 bar	1.4571	**Ex-DDCM 6**
3 – 16 bar	0.6 bar	25 bar		**Ex-DDCM 16**

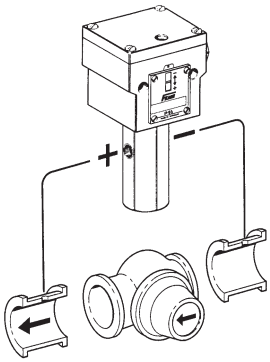
ATEX-approval for gas and dust in preparation.

** also load one direction

* without graduation (only ± scale)

Application sample

Pump monitoring, filter monitoring, flow monitoring



Independent static pressure conditions in the system.
See also chapter “Differential Pressure Transmitter” for same applications.

The differential Pressure of a pump is monitored by a DDCM… Pressure Switch.

When pressure falls below a certain adjusted level, the switch will be activated. The DDCM-Differential Pressure Switch acts independent of the static pressure of the application.

Type series DPS

Differential pressure switches for ventilation and air-conditioning

Differential pressure switch for filter, fan or air flow monitoring in air-conditioning and ventilation systems.

Pressure connection: Plastic connection piece with 6 mm external diameter.
Pressure medium: Air, as well as non-combustible and non-aggressive gases.
Pressure membrane: Silicon.
Maximum permissible operating pressure: 5000 Pa for all types.
Switching function: single-pole change-over.
Switching capacity: 1.5 (0.4) A / 250 VAC
Type of protection: IP 54

Type overview

DPS

Setting range for upper switching pressure	*Switching difference (Mean values)*	*Type*
20 – 200 Pa	10 Pa	**DPS 200 F**
40 – 400 Pa	20 Pa	**DPS 400 F**
200 – 1000 Pa	100 Pa	**DPS 1000 F**
500 – 2500 Pa	150 Pa	**DPS 2500 F**

Accessories supplied with the device:
2 m silicone hose, 2 connection pieces with mounting screws,
2 self-tapping screws for mounting the housing, 3 screw terminals for the electrical connection.

Optional accessory
DPSLF L-shaped bracket for installation turned by 90°, e. g. in the ceiling area.
(DPS 400 L includes DPS 400 together with L-shaped mounting bracket).

The housing lid can be mounted in 3 different directions. This allows max. flexibility in cable entrance and pressure connection mounting directions.

Type series HCD

Pressure and Differential pressure switches for neutral gases (DVGW-tested)

The pressure switches of series HCD are suitable for neutral and non-aggressive gases. They can be used for monitoring overpressure, vacuum and differential pressure. It complies with the gas appliance directive 90 / 396 / EEC.

Pressure connection: Pressure connection for overpressure: G ¼″, internal tread.
For vacuum and differential pressure: G ⅛″, internal thread.

Type of protection: IP 40 according to DIN 40050.

HCD

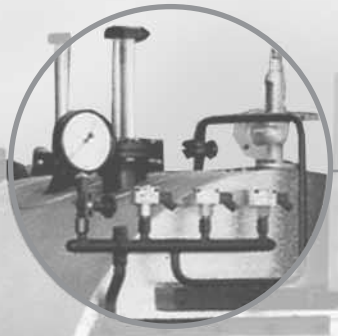
Range of adjustment (Pascal)	*Switching diff. (Pascal) in lower range*	*Switching diff. (Pascal) in upper range*	*Max. working pressure (Pascal)*	*DVGW Reg.-No.*	*Type*
20 – 300	30 – 50		10000	E 3085/2	**HCD 6003**
100 – 1000	30 – 100		10000	E 3085/2	**HCD 6010**
500 – 5000	150 – 300		20000	E 3085/2	**HCD 6050**
1500 – 15000	400 – 1000		30000	E 3085/2	**HCD 6150**

The switching differential is not adjustable. The low switching differentials are valid for the lower range of adjustment, the higher values for the upper ranges.

These Pressure Switches are only available in above mentioned versions. No additional functions and features possible.

Honeywell

Pressure Switches for Safety Applications

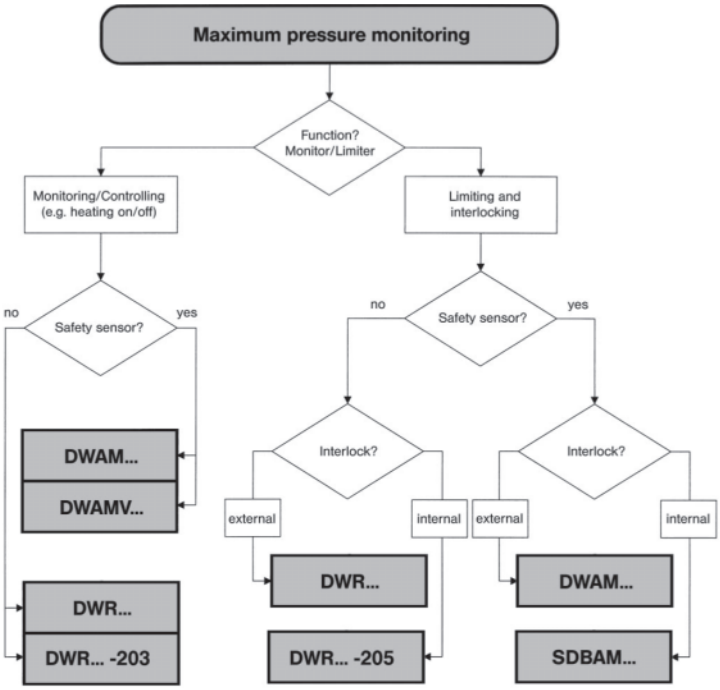


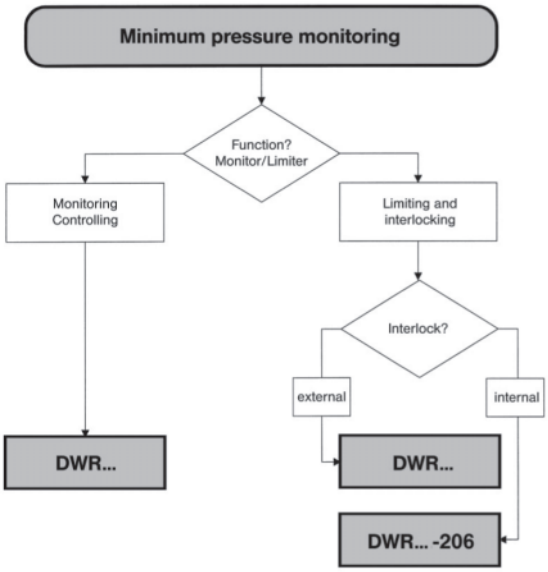
Info

Selection of the pressure monitors / pressure limiters

for steam and hot water systems according to TRD 604, DIN 4751, P. 2

Selection diagrams





Minimum pressure monitors (DRW series) can also be used as **protection against running dry** for installations up to 350 kW.

Application sample

Equipment of a boiler with pressure monitor and pressure limiter

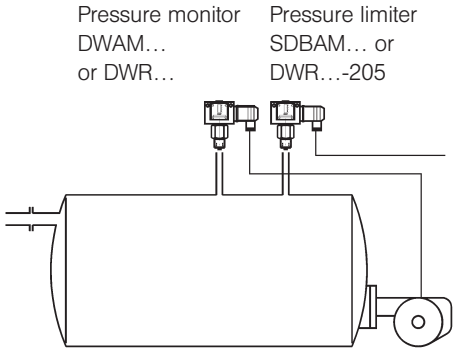
Pressure monitor for burner control

DWAM… or DWR…
(without adjustable switching differential)
or
DWAMV… or DWR…–203
(with adjustable switching difference for controlling function)

Maximum / minimum pressure limiter for safety monitoring:

SDBAM… or DWR…–205
(with internal interlock, unlocking button on the pressure limiter) or
DWAM… or DWR…
(with external interlock in the control cabinet).

Application sample for external interlock see.



Type series DA

Maximum pressure monitors and limiters

with selfmonitoring sensor for steam and hot water

Component tested for: **Steam** Systems according to TRD 604
Hot water Systems according to DIN 4751, P.2

Testing basis: VdTÜV-Memorandum "Druck 100/1"

TÜV-Registration No.: TÜV · DW 99–132 for series DWAM…
TÜV · DW 99–133 for series DWAMV…
TÜV · SDB 99–134 for series SDBAM…

Function: Pressure monitor / Pressure limiter

Direction of action: For max. pressure monitoring

Sensor: **"Of special construction" due to selfmonitoring**

TÜV TESTED

Type overview

DWAM 1

Range of adjustment (bar)	*Switching diff. (Mean value) (bar)*	*Max. operating pressure (bar)*	*TÜV-Registration-No.*	*Type*
Pressure monitors without differential adjustment for max. pressure monitoring*				
0.1 – 0.6	0.04	5	TÜV.DW.99–132	**DWAM 06**
0.2 – 1.6	0.05	5	TÜV.DW.99–132	**DWAM 1**
1.2 – 6	0.2	10	TÜV.DW.99–132	**DWAM 6**
1.2 – 6	0.25	20	TÜV.DW.99–132	**DWAM 625**
3 – 16	0.4	20	TÜV.DW.99–132	**DWAM 16**
6 – 32	1.2	45	TÜV.DW.99–132	**DWAM 32**

SDBAM 2,5

Pressure monitors with differential adjustment for max. pressure monitoring				
0.2 – 1.6	0.12 – 0.6	5	TÜV.DW.99–133	**DWAMV 1**
1.2 – 6	0.4 – 1.5	10	TÜV.DW.99–133	**DWAMV 6**
3 – 16	0.8 – 2.5	20	TÜV.DW.99–133	**DWAMV 16**
6 – 32	2.5 – 6.0	45	TÜV.DW.99–133	**DWAMV 32**

Range of adjustment (bar)	*Switching diff. (Mean value) (bar)*	*Max. operating pressure (bar)*	*TÜV-Registr.-No.*	*Type*
Pressure limiters without differential adjustment for max. pressure monitoring*				
0.2 – 1.6	0.12	5	TÜV.SDB.99–134	**SDBAM 1**
0.4 – 2.5	0.15	5	TÜV.SDB.99–134	**SDBAM 2.5**
1.2 – 6	0.4	10	TÜV.SDB.99–134	**SDBAM 6**
1.2 – 6	0.6	20	TÜV.SDB.99–134	**SDBAM 625**
3 – 16	0.8	20	TÜV.SDB.99–134	**SDBAM 16**
6 – 32	3.0	45	TÜV.SDB.99–134	**SDBAM 32**

Special features

- **"Of special construction"** due to selfmonitoring
- **Sealing**
  Generally available for safety pressure limiting devices SDBAM. For pressure monitor switches upon request.
- **Welded sensor**
  completely made of stainless steel
- Available in EEx-i version (see also DBS-series)
- Medium and ambient temperature
  –20 to +70 °C

*The pressure monitors DWAM… can also be used for maximum pressure limitation, by using an external interlock.

For **Minimum Pressure monitoring** see series DWR…
– Minimum Pressure Monitor: DWR… (also available as a Maximum Pressure Monitor).
– Minimum Pressure Limiter: DWR with extension …-206

In case of Minimum Pressure Limitation the sensor bellows are from "self monitoring" construction.

Type series DWR

Pressure monitors

DWR 625

component tested for steam and hot water, burnable gases and liquid fuels

Component tested for:	**Steam**	System according to TRD 604
	Hot water	System according to DIN 4751, T.2
	Burnable gases	DVGW work sheet G 260
	Liquid fuels	e.g. fuel oils
Testing basis:	Pressure 100 / 1, Issue 4.83 DIN 3398, T.3, Issue 11.92 DIN 3398, T.4, Issue 10.86	
Registration No.:	TÜV.DWFS (SDBFS) 00-281 NG-4346 AQ 1411 3 CO2 82000	
Function:	Pressure monitor or Pressure limiter (with internal or external interlock)	
Direction of action:	DWFS, SDBFS for max. pressure and min. pressure monitoring	

DIN Geprüft TÜV TESTED

DVGW

Of "Special construction" certificate due to test with 2 million switching cycles.

Special features

- "Of special construction" according to pressure standard "Druck 100/1".
- Welded sensor completely made of stainless steel.
- Can be used for maximum pressure and minimum pressure monitoring as monitor and limiting device with internal or external interlock.
- Available in EEx-d or EEx-i version (see also DBS-series).
- Medium and ambient temperature –25 to +70 °C (for Ex-version –15 to +60 °C).

Type overview

Range of adjustment (bar)	*Switching diff. (Mean values) (bar)*	*Maximum operating pressure* Gas Applications DIN 3398 P.3 (bar)*	*Other Applications (bar)*	*Type*
Switching difference not adjustable				
0.1 – 0.6	0.04	6	6	**DWR 06**
0.2 – 1.6	0.06	6	6	**DWR 1**
0.2 – 2.5	0.1	10	16	**DWR 3**
0.5 – 6	0.2	10	16	**DWR 6**
0.5 – 6	0.25	20	25	**DWR 625**
3 – 16	0.5	20	25	**DWR 16**
4 – 25	1.0	50	63	**DWR 25**
8 – 40	1.3	50	63	**DWR 40**
Switching difference adjustable				
0.1 – 0.6	0.08 – 0.5	6	6	**DWR 06-203**
0.2 – 1.6	0.15 – 0.6	6	6	**DWR 1-203**
0.2 – 2.5	0.17 – 1.2	10	16	**DWR 3-203**
0.5 – 6	0.3 – 1.4	10	16	**DWR 6-203**
0.5 – 6	0.4 – 2.5	20	25	**DWR 625-203**
3 – 16	0.75 – 3.15	20	25	**DWR 16-203**
4 – 25	1.3 – 6.0	50	63	**DWR 25-203**
8 – 40	2.3 – 6.6	50	63	**DWR 40-203**

Pressure monitors DWR… can also be used as maximum pressure and minimum pressure limiter with external interlocking.

Ex-DWR 16

ATEX-approval for gas and dust in preparation.

***Operating pressure**
Column A applies for gas applications to DIN 3398 P.3. For other applications column B is applied for.

Ex -versions (EEx de IIC T6) e.g. for burnable gases (housing 700)

0.1 – 0.6	0.04	6	6	**Ex-DWR 06**
0.2 – 1.6	0.06	6	6	**Ex-DWR 1**
0.2 – 2.5	0.1	10	16	**Ex-DWR 3**
0.5 – 6	0.2	10	16	**Ex-DWR 6**
0.5 – 6	0.25	20	25	**Ex-DWR 625**
3 – 16	0.5	20	25	**Ex-DWR 16**
4 – 25	1.0	50	63	**Ex-DWR 25**
8 – 40	1.3	50	63	**Ex-DWR 40**

EEx-i-version (intrinsically safe) degree of protection with optional function ZF 513.
Example for ordering: **DWR 16-513**

■ **DWR…-205 and …-206 with internal interlock see next page**

Type series DWR-B

Pressure limiters

DWR 625-205

(with manual reset) for steam and hot water, burnable gases and liquid fuels

Component tested for:	**Steam**	Systems according to TRD 604
	Hot water	Systems according to DIN 4751, T.2
	Burnable gases	DVGW work sheet G 260
	Liquid fuels	e. g. fuel oils
Testing basis:		Pressure 100 / 1, Issue 4.83 DIN 3398, T.3, Issue 11.92 DIN 3398, T.4, Issue 10.86
Registration No.:		TÜV.SDBF 02-309 TÜV.SDB 02-310 NG-4346 AQ 1411 3 CO2 82000
Function:		Pressure limiter (with internal interlock)
Direction of action:		for max. pressure and min. pressure monitoring
Sensor:		**Of "Special construction" certificate due to test with 2 million switching cycles.**

DIN Geprüft TÜV TESTED DVGW

Special features

- "Of special construction" according to pressure standard "Druck 100/1"
- Welded sensor completely made of stainless steel.
- Can be used for maximum pressure and minimum pressure monitoring as monitor and limiting device with internal or external interlock.
- Medium- and ambient temperature –25 to +70 °C.

Accessory

- Sealing, see page 73.

* **Operating pressure**
Column A applies for gas applications to DIN 3398, P.3. For other applications column B is applied for.

The pressure limiters are equipped with a reclosing lockout for the mechanical interlocking of the switch-off state. If the switching point set on the pressure limiter is reached, the limiter switches off, the switch-off state is retained even if the pressure changes again. Switching back is possible only by manual actuation of the reset button. The pressure at the sensor must have lowered so that unlocking is possible (for maximum pressure limiters) or raised (for minimum pressure limiters).
The values for the pressure change are listed in the type overview.
Important: In the selection of the limiter, it is necessary to differentiate strictly whether the device is used for maximum or minimum pressure monitoring. It is not possible to reverse the direction of action at the pressure limiter.

Maximum pressure limiters (with integrated manual reset)

Range of adjustment (bar)	*Pressure change for unlocking (bar)*	*Maximum operating pressure* (bar)*		*Type*
		A	*B*	
0.1 – 0.6	0.06	6	6	**DWR 06-205**
0.2 – 1.6	0.09	6	6	**DWR 1-205**
0.2 – 2.5	0.20	10	16	**DWR 3-205**
0.5 – 6	0.30	10	16	**DWR 6-205**
0.5 – 6	0.50	20	25	**DWR 625-205**
3 – 16	0.70	20	25	**DWR 16-205**
4 – 25	1.4	50	63	**DWR 25-205**
8 – 40	2.3	50	63	**DWR 40-205**

Minimum pressure limiters (with integrated manual reset)

0.1 – 0.6	0.06	6	6	**DWR 06-206**
0.2 – 1.6	0.09	6	6	**DWR 1-206**
0.2 – 2.5	0.20	10	16	**DWR 3-206**
0.5 – 6	0.30	10	16	**DWR 6-206**
0.5 – 6	0.50	20	25	**DWR 625-206**
3 – 16	0.70	20	25	**DWR 16-206**
4 – 25	1.4	50	63	**DWR 25-206**
8 – 40	2.3	50	63	**DWR 40-206**

For Maximum Pressure Limiters with Sensor "Of special construction" see Type series SDBAM.
Also type series DWAM… can be used (only with external electrical interlock) as a Maximum Pressure Limiter. In case of Minimum Pressure Limitation the sensor bellows are from "self monitoring" construction.

Type series DG

Pressure Monitors for fuel gases

DVGW-tested to DIN 3398, part 1 and part 3 and gas appliance directive 90/396 EEC

The gas pressure monitors are suitable for all gases to the DVGW work-sheet G 260 and for air. Tested to the requirements of DIN 3398 part 1 and part 3. Ambient temperature: –25° to 60 °C. DVGW-Registration No. NG-4346 AP 1011. CE-Identnumber: CE-0085 AQ 1088.

DGM 310 A

Range of adjustment	*Switching differential (Mean value)*	*Max. working pressure*	*Materials**	*Type*
15 – 60 mbar	6 mbar	0.8 bar	Cu + Ms	**DGM 306 A**
20 – 100 mbar	7 mbar	0.8 bar	Cu + Ms	**DGM 310 A**
40 – 250 mbar	10 mbar	0.8 bar	Cu + Ms	**DGM 325 A**
100 – 600 mbar	25 mbar	2 bar	Cu + Ms	**DGM 06 A**
0.2 – 1.6 bar	40 mbar	3 bar	Cu + Ms	**DGM 1 A**
15 – 60 mbar	8 mbar	5 bar	1.4104	**DGM 506**
40 – 160 mbar	12 mbar	5 bar	1.4104	**DGM 516**
100 – 250 mbar	20 mbar	5 bar	1.4104	**DGM 525**

* Stainless steel 1.4104 ≈ AISI 430 F

EExi-version (intrinsically) · Degree of protection EEx-ia
As above, but with optional function ZF 513 (EEx-i). Example for ordering: **DGM 516–513**

Ex-DGM 506

ATEX-approval for gas and dust in preparation.

-version · Degree of protection EEx de IIC T6

Ambient temperature –15° to 60 °C
DVGW-Registration-No. NG-4346 AP 1011.

Range of adjustment	*Switching differential (Mean value)*	*Max. working pressure*	*Materials**	*Type*
15 – 60 mbar	10 mbar	5 bar	1.4104	**Ex-DGM 506**
40 – 160 mbar	12 mbar	5 bar	1.4104	**Ex-DGM 516**
100 – 250 mbar	20 mbar	5 bar	1.4104	**Ex-DGM 525**

Further pressure monitors for fuel gases see series DWR and HCD.

Type series FD

Maximum pressure limiter for liquid gas systems

TÜV-tested, with manual reset interlock

Setting range 3–16 bar

The series FD pressure limiters are constructed in accordance with the special directives of liquid gas engineering. The requirements of **TRB 801** Appendix II § 12 are fullfiled. All parts of the sensor coming into contact with the medium are stainless steel 1.4104 and 1.4571. Over and above the requirements of the TRB, the **pressure sensor is of self-monitoring design,** i. e. in the event of rupture of the pressure bellows, the pressure limiter switches off to the safe side. The pressure sensor thus complies with **"Special Design"** as defined in VdTÜV Code of Practice "Pressure 100/1". The pressure limiters are operated in intrinsically safe control circuits (Explosion-proof Protection EEx-ia). With the Ex 041 isolating switching amplifier, the control circuit is additionally monitored for circuit break and short-circuit.

EEx ia

FD 16-326

Switching differential	*Interlock**	*TÜV Reg. No.*	*Type*
0.5	external	09-91-0109	**FD 16-326**
2.5	internal	09-91-0110	**FD 16-327**

Important: They only may be used in conjunction with Ex 041 isolating switching amplifier.
* Interlock on reaching to cutout point (maximum pressure set).

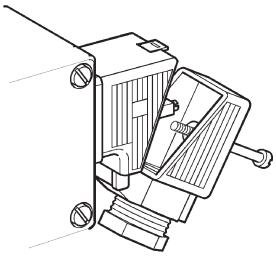
Honeywell

Pressure Transmitters

Overview MODUFLEX

Pressure and differential pressure transmitters

Type series	*Ranges*	*Medium*	*Output signal*	*Sensor*	*Notes / application*
SN 	Pressure up to 60 bar Working ranges of SN…-395 adjustable by jumper 3-wire-system	Liquid and gaseous (stainless steel sensors)	0–10 V/ 4–20 mA (3-wire-system)	piezoresistive	High pressure control Stainless steel sensor Display module options Display AZ 331 for 3-wire-system
	Pressure up to 40 bar 2-wire-system	Liquid and gaseous (stainless steel sensors)	4–20 mA (2-wire-system)	piezoresistive	Display AZG 241 for 2-wire-system
F 	Vacuum up to 40 bar Differential pressure up to 10 bar Working ranges steplessly adjustable	Liquid and gaseous	0–10 V 0–20 mA 4–20 mA (3-wire-System)	mechanical inductiv	Also with display AZ 331 Also for vacuum and differential pressure
SK 	± 5 mbar to 0–20 mbar Working ranges fixed or adjustable by jumper	Gaseous	0–10 V	piezoresistive	For heating and air conditioning e.g. for filter and ventilation systems Also with LCD-display AK-SK
DPT	Up to 0–25 mbar	Gaseous	0–10 V	piezoresistive	Also with LED-display
LON products 	for pressure, differential pressure and temperature	Liquid and gaseous		mechanical inductiv piezoresistive	



The user friendly plugs can be opened.
Apart from simplified installation, it is possible to measure the supply voltage and output signal directly at the open plug.

Conditon on delivery: The transmitters are assembled completely in the factory (sensor + evaluation module + cover) and adjusted to the nominal range.
Additional modules and external modules are delivered separately.

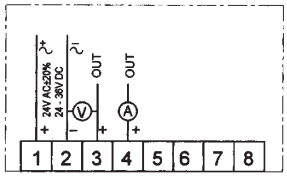
Factory adjustment: The devices are adjusted in factory to the relevant nominal range.

Moduflex · Type series SN 3

Pressure transmitters, piezoresistive 3-wire-system

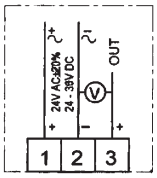
SN…-311
2 output signals 0–10 V and 4–20 mA

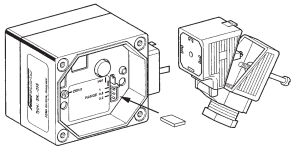
Connection diagramm SN…311



SN…-395

Connection diagramm





Range selectable by jumper (100 %, 50 %, 20 % of the nominal range)

for liquid and gaseous media

Technical data

Pressure connection	G ½″ outside to DIN EN 857, Wrench size SW 27
Materials	Sensor housing: 1.4571 Pressure membrane: 1.4435 Terminal housing: Makrolon
Installation	Directly on pressure line
Cable entry	Plug connection to DIN 43 650 or 2 x PG 9 (only 311-series)
Degree of protection	IP 65
Operating voltage	24 VAC ± 20 % or 24 V…36 VDC
Output signal	0…10 V
Total accuracy	≤ 1 % FS, typical ≤ 0,5 % FS
Propagation delay (response time)	≤ 10 ms (max.)
Compensated range	0–100 °C
Medium temperature	–30 to +100 °C
Ambient temperature	0–50 °C
Long term drift	max. ± 0,5 % FS/year

Type series SN…311 / Type series SN…-395
The nominal ranges quoted in the following type overview of the types SN…311 can be limited by 50 % of the nominal range by setting potentiometers on the evaluation electronics. The zero point can also be shifted by 50 % of the nominal range.

Inversion of the output signal possible

Type overview

Working range (nominal range) (bar)	*Smallest settable working range (bar)*	*Max. allowable pressure (bar)*	*Type*
Output signal 0–10 V and 4–20 mA, terminal connection			
0 – 0.25	0.125	0.75	**SN 025-311**
0 – 0.6	0.3	1.8	**SN 06-311**
0 – 1	0.5	3	**SN 1-311**
0 – 2.5	1.25	7.5	**SN 3-311**
0 – 6	3	18	**SN 6-311**
0 – 10	5	30	**SN 10-311**
0 – 25	12.5	70	**SN 25-311**
0 – 40	20	80	**SN 40-311**
0 – 60	30	120	**SN 60-311**

Working range (nominal range) (bar)	*Smallest settable working range (bar)*	*Max. allowable pressure (bar)*	*Type*
Output signal 0–10 V, plug connection, range adjustable by jumper			
0 – 0.25	0 – 0.125 / 0.05	0.75	**SN 025-395**
0 – 0.6	0 – 0.3 / 0.12	1.8	**SN 06-395**
0 – 1	0 – 0.5 / 0.2	3	**SN 1-395**
0 – 2.5	0 – 1.25 / 0.5	7.5	**SN 3-395**
0 – 6	0 – 3 / 1.2	18	**SN 6-395**
0 – 10	0 – 5 / 2	30	**SN 10-395**
0 – 25	0 – 12.5 / 5	70	**SN 25-395**
0 – 40	0 – 20 / 8	80	**SN 40-395**
0 – 60	0 – 30 / 12	120	**SN 60-395**

Moduflex · Type series SN 2

Pressure transmitters for liquid and gaseous media, 2-wire-system

Technical data

Pressure connection	G ½″ outside to DIN EN 837, Wrench size SW 27
Material	Terminal housing: Makrolon Sensor housing: 1.4571 Pressure membrane: 1.4435
Installation	Directly on pressure line
Cable entry	Plug connection to DIN 43 650 PG 11
Protection class	IP 65
Operating voltage	10 V … 30 VDC
Output signal	4…20 mA, load ≤ (U_B–10 V)/0.02 A
Total accuracy	≤ 1 % FS
Response time	≤ 10 ms
Compensated range	0…100 °C
Max. medium temperature	–30…+110 °C
Ambient temperature	0…60 °C
Work direction	Increasing creating pressure: = increased output signal

Type overview

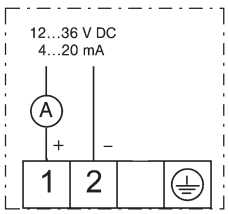
Not adjustable

User friendly plug for easy installation and service

Working range (bar)	*Max. allowable pressure (bar)*	*Type*
Plug connection		
0 – 0.25	0.75	**SN 025-280**
0 – 0.6	1.8	**SN 06-280**
0 – 1	3	**SN 1-280**
0 – 1.6	6.4	**SN 2-280**
0 – 2.5	7.5	**SN 3-280**
0 – 4	16	**SN 4-280**
0 – 6	18	**SN 6-280**
0 – 10	30	**SN 10-280**
0 – 16	48	**SN 16-280**
0 – 25	70	**SN 25-280**
0 – 40	80	**SN 40-280**
0 – 60	120	**SN 60-280**

Accessory: Programmable Display APV 630.

LED-display adjustable for SN…–280 to be mounted between plug and transmitter, programmable, 4 digits	**AZG 241**

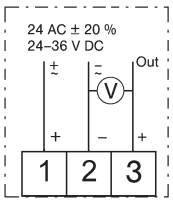


SN… –280

Moduflex · Type series F + ED 3

Pressure transmitter, mechanical-inductive for liquid and gaseous media

Connection diagram



ED 3
Output signal 0–10 V

Pressure transmitter in 3-wire-system

- **with output signal 0–10 V and 0–20 mA**
- **output signal can be reversed**
- **LED-display AZ 331 optional**

The sensor module contains the electrical connectors for power supply and output signal for all plugged modules, i. e. Display module AZ 331.
The nominal ranges can be reduced to the below mentioned smallest settable working ranges by recalibration.

Technical data

Mode of action	mechanical-inductive
Sensor element	Pressure bellows or membrane
Pressure connection	G ½″ outside and G ¼″ inside For types FH…G ¼″ inside
Cable entry	2 x Pg 11
Degree of protection	IP 65 (together with other modules and/or with Lid)
Installation	Directly on the pressure line or wall mounting with 2 screws 4 mm Ø
Accuracy class	1.0

Pressure FN… + ED 3

Working range (nominal range) P_o–P_n	*Smallest settable working range (approx. values)*	*Max. allowable pressure*	*Sensor-material*	*Type*
Overpressure				
0 – 50 mbar	20 mbar	2.5 bar		**FN 505 + ED 3**
0 – 100 mbar	25 mbar	5 bar		**FN 510 + ED 3**
0 – 250 mbar	65 mbar	6 bar		**FN 025 + ED 3**
0 – 500 mbar	125 mbar	6 bar	Stainless	**FN 05 + ED 3**
0 – 1 bar	250 mbar	6 bar	steel	**FN 1 + ED 3**
0 – 2.5 bar	0.7 bar	16 bar	1.4104	**FN 3 + ED 3**
0 – 6 bar	3 bar	18 bar	+	**SN 6-311***
0 – 10 bar	5 bar	30 bar	1.4571	**SN 10-311***
0 – 25 bar	12.5 bar	70 bar		**SN 25-311***
0 – 40 bar	20 bar	80 bar		**SN 40-311***

*piezoresistive sensor

Differencial pressure

0 – 500 mbar	125 mbar	10 bar	Stainless	**FHBN 05 + ED 3**
0 – 1 bar	250 mbar	15 bar	steel	**FHBN 1 + ED 3**
0 – 2.5 bar	0.7 bar	15 bar	1.4305	**FHBN 3 + ED 3**
0 – 5 bar	1.25 bar	15 bar	+	**FHBN 5 + ED 3**
0 – 10 bar	2.5 bar	25 bar	1.4571	**FHBN 10 + ED 3**

Differential pressure
FHBN… + ED 3

Accessories

■ LED display module, to be plugged on	**AZ 331**
■ Programmable display	**APV 630**

For differencial pressure

■ Valve combination	**VKD 3, VKD 5**
■ Male adapter union	**MAU 8**

Moduflex · Type series SK / SKV

Differential pressure transmitter

for air-conditioning / ventilation – pressure ranges adjustable with jumper

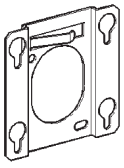
Product description and applications

Differential pressure transmitter – in 3-wire technology, with an output signal of 0–10 V (± 1 mA), for air conditioning and other ventilation applications, e. g. for filter monitoring, pressure or flow control, max. pressure control etc.

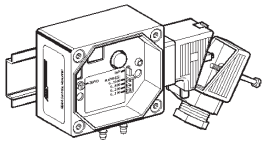
The transmitter can be used for over pressure (pressure connection to +), for vaccum (pressure connection to –) and for differential pressure (high pressure to +, low pressure to –).

Technical data

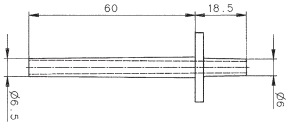
Supply voltage	18…24…30 VAC, 50/60 Hz or 16…24…32 VDC
Operating voltage	24 VAC ± 20 % or 24 V…36 VDC
Pressure connection	Ø 5 x 11 (for flexible hose dia i = 5 mm)
Degree of protection	IP 65
Medium temperature	–10 to 70 °C Max. 95 % r.F. relative humidity
Ambient temperature	0–50 °C (compensated range)
Output signal	0–10 V, ± 1 mA with jumper invertable.
ZERO-Offset	with potentiometer, if needed
Linearity and hysteresis error	Max. ± 1.2 % FS, SK 20 max. 2.3 %, typ 0.4 %
Temperature drift	(0–50 °C) Max. ± 0.25 %/K
Maximum perm. pressure	20 kPa
Accessories included in delivery:	– mounting bracket H 11 including 2 screws – Accessory kit SK-K consisting of 2 m of silicone hose 2 joining pipes with extensions 4 screws 1 spare jumper
Optional accessories	plug-in bracket H 12 for mounting on DIN rail, e. g. in cabinet.



Mounting bracket H 11



Mounting on DIN rail with plug-in bracket H 12



Joining pipe with extension DPS-J

Type summary

Nominal and adjustable ranges Pa	***without Display*** *Type*	***with LED–display*** *Type*
0 to 1000 **0 to 500** 0 to 200 (with jumper adjustable)	**SK 10** **SK 5***	**SK 10-AK** **SK 5-AK***
0 to 2000 0 to 1000 0 to 400 (with jumper adjustable)	**SK 20**	**SK 20-AK**
-500 to +500 (fixed) **-1000 to +1000 (fixed)**	**SKV 5** **SKV 10**	**SKV 5-AK** **SKV 10-AK**

* SK 5 is technically identical with SK10, but the product will be delivered with the frequently used jumper setting 0–500 Pa ex-factory. This avoids changing the jumper when 0–500 Pa is needed.

Accessories

LCD-display (in Pa), integrated in housing lid (when ordered separately).	**AK-SK**
Plug-in bracket for mounting on DIN rail	**H 12**

Type series DPT (D)

Differential pressure transmitter, piezoresistive

for gaseous, non-aggressive media

General

The differential pressure transmitters of the DPT series are used for measuring differential pressure, positive pressure, and vacuum. The transmitters are suitable for:

- Air-conditioning,
- Building automation
- Environmental protection
- Fan and blower control
- Valve and flap control
- Filter and blower monitoring
- Fluid and level monitoring
- Control of air flows

Technical data

Supply voltage	18…24…30 VAC, 50/60 Hz or 16…24…32 VDC
Protection class	IP 54
Process connection	6 mm hose pipe
Electrical connection	Screw terminal block for wire up to 1,5 mm^2
Storage temperature	–10…+70 °C
Humidity	0…95 % r. H. (non condensing)
Load	≤ 470 Ω
Linearity and hysteresis	≤ ± 1 % FS
Response time	10 ms
Longterm stability	typ. ± 0,5 % FS per year
Temperature drift	0…50 °C
	DPT 50 (53)…500 (503) ± 5 % FS
	DPT 1000 (1003) ± 2,5 % FS
	DPT 2500 (2503)…5003 ± 1 % FS

Versions with 0–10 V output signal

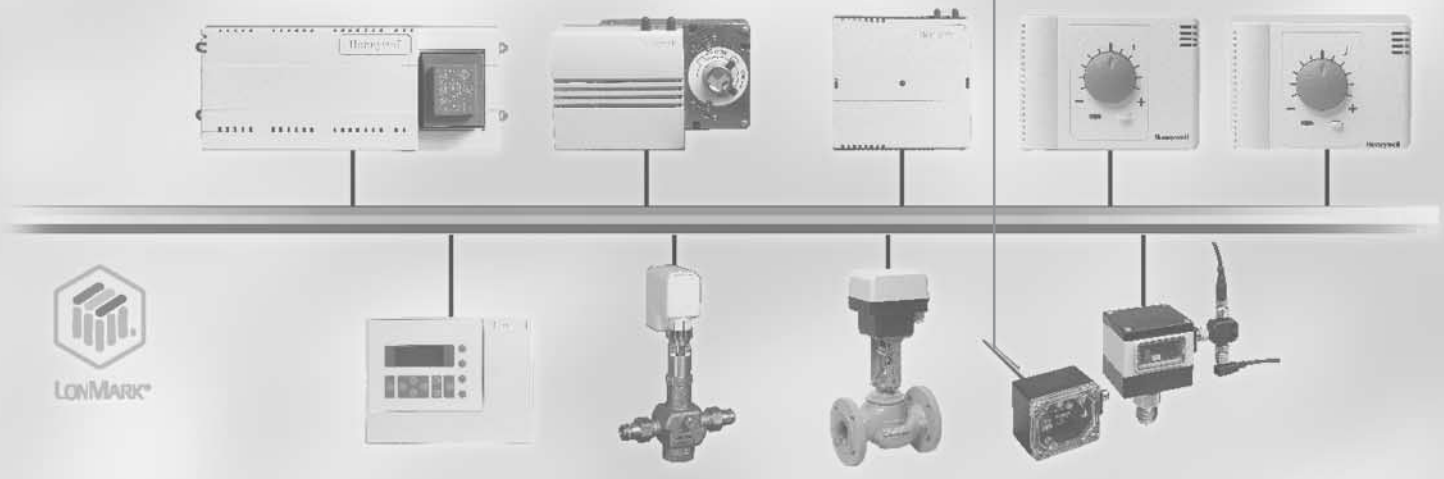
Working range	*Max. allowable pressure*	*Type*
-50 – +50 Pa	25 kPa	**DPT 50**
-100 – +100 Pa	25 kPa	**DPT 100**
0 – 250 Pa	25 kPa	**DPT 250**
0 – 500 Pa	25 kPa	**DPT 500**
0 – 1000 Pa	25 kPa	**DPT 1000**
0 – 2500 Pa	30 kPa	**DPT 2500**
0 – 250 Pa	25 kPa	**DPT 250 D**
0 – 500 Pa	25 kPa	**DPT 500 D**
0 – 1000 Pa	25 kPa	**DPT 1000 D**
0 – 2500 Pa	30 kPa	**DPT 2500 D**

Versions with 4–20 mA output signal

Working range	*Max. allowable pressure*	*Type*
-50 – +50 Pa	25 kPa	**DPT 53**
-100 – +100 Pa	25 kPa	**DPT 103**
0 – 250 Pa	25 kPa	**DPT 253**
0 – 500 Pa	30 kPa	**DPT 503**
0 – 1000 Pa	25 kPa	**DPT 1003**
0 – 2500 Pa	30 kPa	**DPT 2503**
0 – 5000 Pa	50 kPa	**DPT 5003**

Honeywell

LON
Pressure + Temperature



Moduflex · Type series LON

LON Pressure and Differential Pressure Transmitter

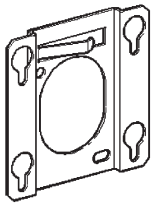
Serviceability
- Service LED visible from outside
- Operation LED visible from outside
- Trigger Switch for Neuron ID accessible after removing Lid
- Barcode with Neuron ID outside placed
- Connection via 5-pole M12 Plug, A-coded

Product Description and Applications

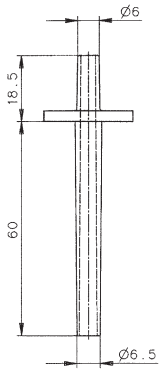
Pressure- and Differential Pressure Transmitter for Filter Monitoring and Ventilation control according standard of LonMark®.
The Transmitter is able to handle Overpressure (Pressure connector +), Vacuum (Pressure connector –) and Differential Pressure (High Pressure on connector + and Low Pressure on connector –).

Technical data

Cable entry	Plug connection M 12 four-pole (a four- or five-pole plug may be used)
Operating voltage	24 VAC ± 20 % or 24 V...36 VDC
Protection class	IP 65
Transceiver and profile	FTT 10 A (LPT 10 compatible) LonMark® certificated Profil 1030
Compensated temperature range	0…50 °C
Max. medium temperature	–25…+85 °C, max. 95 % relative humidity
Materials	Electronic housing: Macrolon
Accessories included in delivery	– Plug M 12 five-pole – 2 m of silicone hose – 2 joining pipes with extensions – Mounting bracket H 11



H 11



joining pipe DPS-J

Technical data transmitter

Pressure port	5 mm hose union
Installation	With mounting bracket H 11 direct on the wall
Linearity	≤ 1 % FS
Measuring method	piezoresistive

Type series SKN…L, SKVN…-L

Working range (nominal range) (Pa)	*Max. allowable pressure (Pa)*	*Type*
0… + 250	25000	**SKN 250-L**
0… + 1250	40000	**SKN 1250-L**
–250… + 250	25000	**SKVN 250-L**
–1250… + 1250	40000	**SKVN 1250-L**

TST

Lon-Accessory	Plug M 12 five-pole	**ST 355**
	5-pole T-divider	**TST 355**
XIF-file	Low Pressure (≤ 32.76 kPa)	**XIFLP 1**
	High Pressure (≥ 32.77 kPa)	**XIFHP 1**

Plug-In and XIF-files by E-Mail: fema@honeywell.com

Moduflex · Type series LON

LON Pressure and Differential Pressure Transmitter for liquid and gaseous media

Features

- LonMark®
  pressure profile #1030
- Uses Echelon LonTalk®
  protocol
- Direct mounting on the
  pressure line
- Factory-configured default
  parameters
- LON service and
  operation LED visible
  without disassembly
- Protection class IP 65
- Easy plug connection M12
- Uses FTT 10A
  Transceiver
- Barcode with Neuron ID
  outside

Common technical data SN and FHBN…-L

Cable entry	Plug connection M 12 four-pole (a four- or five-pole plug may be used)
Operating voltage	24 VAC ± 20 % or 24 V...36 VDC
Protection class	IP 65
Transceiver and profile	FTT 10 A (LPT 10 compatible) LonMark® certificated, Profile 1030#
Ambient temperature	0...+50 °C
Materials	Electronic housing: Macrolon
Accessories included in delivery	**–** Plug M 12 five-pole

Technical data SN

Pressure port	G ½″ male,
Wrench size	SW 27
Materials	Sensor housing: 1.4571, Pressure membrane: 1.4435
Linearity	≤ 1 % FS
Propagation delay	≤ 10 ms
Max. medium temperature	–30…+100 °C
Installation	The series SN sensors are fitted directly to the pipeline or the pressure vessel

SN…-355-L

Working range (nominal range) (kPa)	*Working range (nominal range) (bar)*	*Max. allowable pressure (kPa)*	*Type*
0 … 25	0 … 0.25	75	**SN 025-355-L**
0 … 100	0 … 1	300	**SN 1-355-L**
0 … 250	0 … 2.5	750	**SN 3-355-L**
0 … 600	0 … 6	1800	**SN 6-355-L**
0 … 1000	0 … 10	3000	**SN 10-355-L**
0 … 2500	0 … 25	7500	**SN 25-355-L**

Technical data FHBN

Pressure port	G ¼″ male female
Sensor material	stainless steel 1.4571 / 1.4435
Installation	Direct on pressure line or wall mounting
Linearity	≤ 2.5 % FS
Max. medium temperature	+70 °C
Measuring method	Mechanical-inductive
	Sensor load one direction

FHBN…-355-L

Working range (nominal range) (kPa)	*Working range (nominal range) (bar)*	*Max. allowable pressure (kPa)*	*Type*
0 … 100	0 … 1	1000000	**FHBN 1-355-L**
0 … 250	0 … 2.5	1500000	**FHBN 3-355-L**
0 … 500	0 … 5	1500000	**FHBN 5-355-L**
0 … 1000	0 … 10	1500000	**FHBN 10-355-L**
Accessories			
Mail adapter union, **brass** G ¼″ external thread with 8 mm outside diameter			**MAU 8 / Ms**
Mail adapter union, **stainless steel** G ¼″ ext. thread with 8 mm outside diameter			**MAU 8 / Nst**
Shut-off valve combination, 3 venting valves			**VKD 3**
Shut-off valve combination, 5 venting valves			**VKD 5**

Moduflex · Type series LON

LON Temperature Sensors

Serviceability
- Service LED visible from outside
- Operation LED visible from outside
- Trigger Switch for Neuron ID accessible after removing the lid
- Barcode with Neuron ID on a housing placed sticker
- Connection via 5-pole M12 Plug, A-coded

Application

- Temperature Transmitter for heating, district heating, air conditioning and ventilation according standards of LonMark®.
- Fast medium temperature recording in district heating systems, solar circuits and cooling systems (T7425…).

Technical data LON

Cable entry	Plug connection M 12 four-pole (a four- or five-pole plug may be used)
Operating voltage	24 VAC ± 20 % or 24 VDC…36 VDC
Transceiver and profile	FTT 10 A (LPT 10 compatible), LonMark® certificated, Profile 1040#
Ambient temperature	0…50 °C
Materials	Sensor housing: Macrolon
Accessories included in delivery	– Plug M 12 five-pole – Immersion tube VFH-T (F) / VFL (F) to VF 20

Technical data Sensor

Protection class	V…IP 54 (vertical mounting position) L…IP 54 (vertical mounting position) T…IP 65	
Installation	V…directly in immersion tube L…Flange mounting T…directly in pipeline	
Measuring element	NTC 20 kOhm	
Linearity	Range	
	0…+75 °C	± 0.8 K
	–20…+100 °C	± 1.5 K
	–30…+140 °C	± 2.0 K

VF…L

LF…L

AFF-L
(Roomsensor)

T…-L
(Fast sensor, usable without immersion tube)

Technical data
Series LF…-L, VF…-L, T…-L, AFF-L

Working range (nominal range)	*Immersion depth (mm)*	*Type*
–30… + 100 °C	280	**LF 20-L**
–20… + 110 °C	135	**VF 20-T-L**
–20… + 110 °C	300	**VF 20-L-L**
–20… + 110 °C	75	**T7425 A 1005-L**
–20… + 110 °C	220	**T7425 A 1013-L**
0… + 70 °C	–	**AFF -L**

Immersion Tubes	Immersion tube Cu/Ms for VF 20 T-L	**VFH-T (F)**
	Immersion tube Cu/Ms for VF 20 L-L	**VFL (F)**
	Immersion tube stainless for VF 20 T-L	**VFN-T (F)**
	Immersion tube steel for VF 20 L-L	**VFL-N (F)**
LON-Accessory	Plug M 12 five-pole	**ST 355**
	5-pole T-divider	**TST 355**
XIF-file Temperature NTC		**XIFTN 1**

Plug-In and XIF-file by E-Mail: fema@honeywell.com

Accessory LON

TST

Honeywell

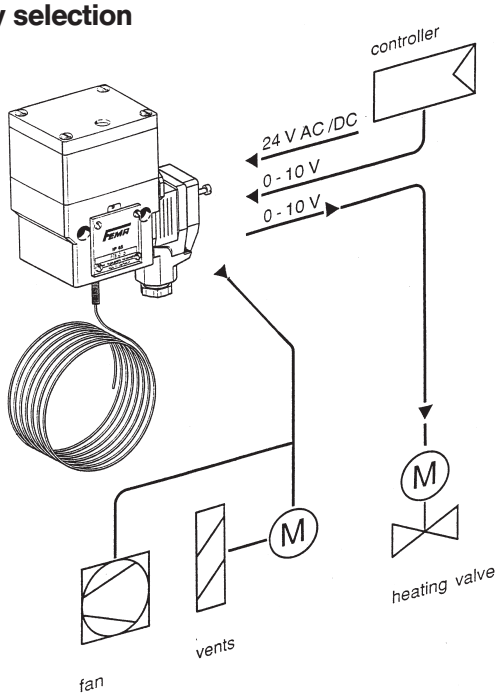
Temperature Sensors

Type series FTS

Two-phase frost protection

FTS

with limiter contact and integrated priority selection



Analog frost protection
With falling temperature the frost protection generates a rising output signal 0–10 V.

Switching function
If the temperature drops further, a limiter contact (single-pole changeover contact) is actuated.

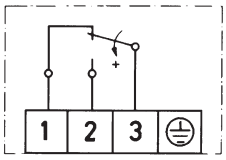
Maximum selection for valve signal
If the output signal of the controller (Y signal) is looped through the frost protection, a maximum selection of the two signals takes place.
If the Y signal from the controller is larger than the output signal of the frost protection, the controller determines the position of the heating valve (normal operation). If the output signal of the frost protection is larger than the Y signal of the controller (risk of frost), then the frost protection determines the position of the heating valve.

Self-monitoring sensor
The sensor acting over the entire length is self-monitoring, i. e. in the case of breakage or damage of the capillary tube, “Risk of frost” is signaled.
If the signal of the controller is not looped through, then the FTS outputs the frost control signal.

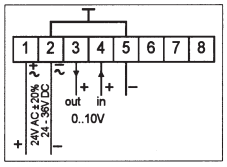
Cascades for large coils
For very large heating coils several FTS can be used in cascade.

Connection diagrams

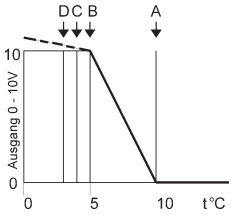
Plug connection



Terminal connection



Characteristics



1st phase
A=10 °C
Start of the working point (with falling temperature)
B=5 °C
End of the constant range

2nd phase
C=4 °C
Switching back point of the limiter contact
D=3 °C
Switching point of the limiter contact

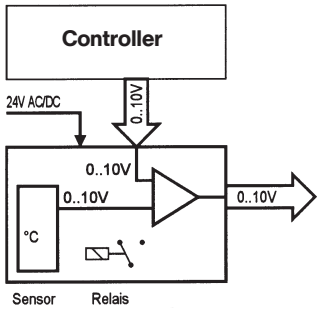
Technical data

Supply voltage	24 VAC ± 20 % or 24–36 VDC
Output signal	0–10 V + floating limiter contact (at falling temperature)
Power consumption	max. 1 W
Cable entry	2 x Pg 11 for electronic Large user friendly plug connection to DIN 43650 for limit value switch.
Degree of protection	IP 65
Installation	With 2 size 4 mm screws directly one the duct wall. 5 capillary tube holders, Type H3 are included in the supply.
Ambient temperature	12–50 °C Caution: at ambient temperatures below 10 °C, the unit reacts and signals “Risk of frost”.
Switching capacity	8 A 250 VAC

Range of action	*Capillary tube*	*Type*	
10…3 °C	6 m	**FTS**	**015**
10…3 °C	3 m	**FTSB**	**015**

Packaging includes 5 capillary tube holders Type H 3.

Block circuit diagram



Type series PZ 17

Temperature transmitters, Pt 100 made of high-grade steel sensor

output signal 4–20 mA (2-wire)

The temperature transmitters consist completely of stainless steel (tube 1.4571, transmitter housing 1.4301). The transmitter module is housed for easy access in the housing head and can also be replaced as required. A Pt 100, Class B (DIN IEC 751) is used as sensor.

Technical data

Cable entry	Pg 11
Degree of protection	IP 65
Maximum temperature	60 °C
Operating voltage	12–36 VDC
Output signal	4–20 mA

Transmitter with immersion probe (screw-in thread)

Screw in thread G ½″, 8 mm Ø

Immersion depth L (mm)	*Max. allowable pressure (bar)*	*Type*
100	40	**PZ 171-100/…**
150	40	**PZ 171-150/…**
200	35	**PZ 171-200/…**
250	34	**PZ 171-250/…**

The pressure data apply up to a temperature of 250 °C.
Immersion tube R 185 see page 46.

Transmitter with air duct probe (not for humid and aggressive media) 8 mm Ø

Immersion depth L (mm)		*Type*
100		**PZ 177-100/…**
150		**PZ 177-150/…**
200		**PZ 177-200/…**
250		**PZ 177-250/…**

Fastening flange R 187.
Please add the identification code of the temperature range to the type No. Example: PZ 171-200/100
Immersion tube R 185 see page 46.

Temperature ranges

Range	No.
–50 … + 50 °C	55
–50 … + 100 °C	51
0 … 50 °C	50
0 … 100 °C	100
0 … 200 °C	200

Higher temperature ranges (to 600 °C) on request.

Type series P 17

Temperature sensors Pt 100 / Pt 1000 in stainless steel

The temperature sensors consist completely of high-grade steel (tube: 1.4571, terminal housing: 1.4301).

Technical data

Sensor element	Pt…, Class B to DIN IEC 751, 3-wire-connection
Cable entry	Pg 11
Degree of protection	IP 65
Temperature range	–50…600 °C

Immersion probe with screw-in thread G ½″ 8 mm Ø

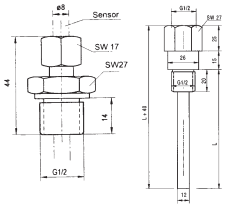
Immersion depth (mm)	*Max. pressure (bar)*	*Type Pt 1000*	*Type Pt 100*
100	40	**P 271-100**	**P 171-100**
150	40	**P 271-150**	**P 171-150**
200	35	**P 271-200**	**P 171-200**
250	35	**P 271-250**	**P 171-250**

The pressure data apply up to a temperature of 250 °C.
Immersion tube R 185.

Air duct probe (not for humid and aggressive media) 8 mm Ø

Immersion depth (mm)	*Max. pressure (bar)*	*Type Pt 1000*	*Type Pt 100*
100	40	**P 277-100**	**P 177-100**
150	40	**P 277-150**	**P 177-150**
200	35	**P 277-200**	**P 177-200**
250	35	**P 277-250**	**P 177-250**

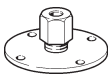
Mounting flange R 187.



R 18 **R 185**

Immersion tube G ½″ (only for P 171…, P 271… and PZ 171…)

Immersion depth (L) (mm)	*Type*
100	**R 185-100**
150	**R 185-150**
200	**R 185-200**
250	**R 185-250**



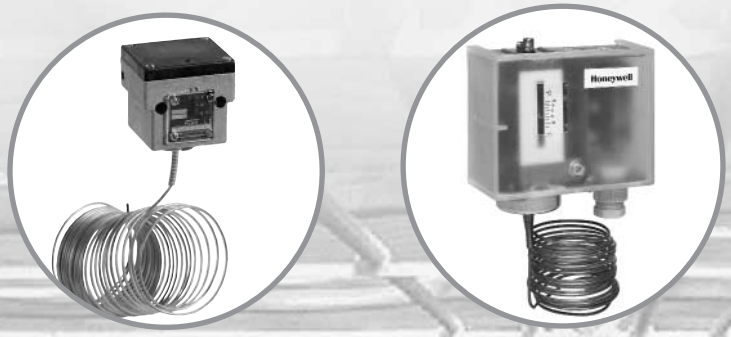
R 187

Mounting flange R 187

for air duct probe, stainless steel 1.4571

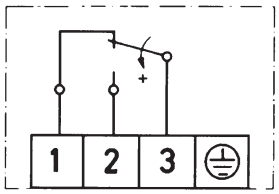
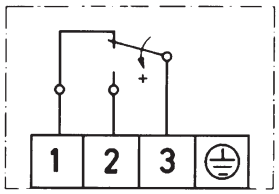
Honeywell

Thermostats + Hygrostats

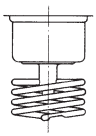


Mechanical Thermostate

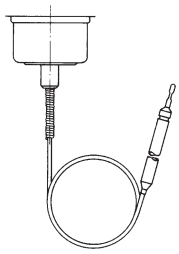
Technical data

	Normal version	Ex-version
	 …300	 …700
Switching housing	Aluminium diecast GDAlSi 12	Aluminium diecast GDAlSi 12
Switching function and connection drawing (applies only for version with microswitch)	Floating change-over contact. With rising pressure switching over single-pole from 3–1 to 3–2. 	Floating change-over contact. With rising pressure switching over single-pole from 3–1 to 3–2. 
Switching capacity (applies only for version with microswitch)	8 A at 250 VAC 5 A at 250 VAC inductive 8 A at 24 VDC 0.3 A at 250 VDC	3 A at 250 VAC 2 A at 250 VAC inductive 3 A at 24 VDC 0.03 A at 250 VDC
Installation position	arbitrary, preferably vertical	vertical
Degree of protection (in vertical position)	IP 65	IP 65
Ex degree of protection	–	EEx de IIC T6 tested to EN 50014/50018/50019 (CENELEC)
PTB-approval	–	Ex-90.C.1059
Electrical connection	Terminal connection	Terminal connection
Cable entry	M 16 x 1,5	M 16 x 1,5
Ambient temperature	–15 to +70 °C	–15 to +60 °C
Switching point	Adjustable with spindle	Adjustable with spindle after the terminal box lid is removed.
Switching difference	Adjustable or not adjustable (see type overview)	Not adjustable
Medium temperature	Max. 70 °C, briefly 85 °C	Max. 60 °C
Vibration strength	Up to 4 g no noteworthly deviations.	
Isolation values	Overvoltage category III, contamination class 3, reference surge voltage 4000 V. The conformity to DIN VDE 0110 (01.89) is confirmed.	

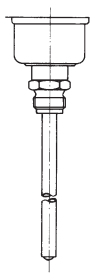
Probe systems



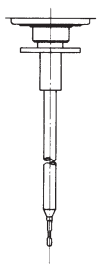
Room probe TRM



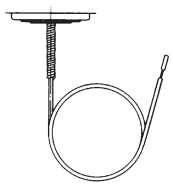
Capillary tube probe TAM



Rod probe TX + R 1



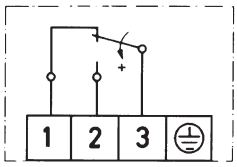
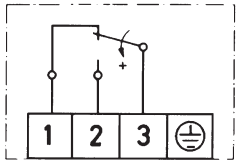
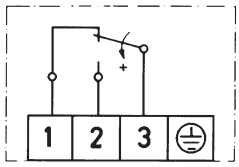
Air duct probe TX + R 6



Frost protection probe FT

Thermostats

Switch units / connection diagrams

Terminal connection Series 300	*Description*	*Connection diagrams*
	Normal version microswitch, single pole changeover	
ZFT 213	**Gilded contacts** with little transition resistance (e. g. for low tension) Cannot be supplied with adjustable switching differential	
ST 218 **ZFT 351**	**Plug connector with position indication** 12 V–240 VAC/DC **Degree of protection IP 65 with surface protection** Housing series 300 (Terminal connections)	
ZFT 513	**EExi-version** housing 300, cable entry and terminals blue Gold plated contacts, degree of protection IP 65	
ZFT 5970	**Adjustment of one switching point according to customers instruction**	
ZFT 5971	**Adjustment and sealing of switching points according to customers instruction**	

Example for ordering:

TX 150-513

- 513 — Code for optional function (minimum limiter)
- 150 — Code of temperature range
- TX — Type

Type series TRM

Industrial room thermostats

Fema room thermostats are suitable for industrial plants, for greenhouses, stables, and warehouses, also for monitoring the maximum temperature in switchgear cabinets and relay stations.
Room thermostats are supplied complete with H 1 wall bracket.

TRM 40-301

Range of adjustment	*Switching diff. (Mean value)*	*Max. permissible temperature on sensor*	*Type*
Switching differential not adjustable			
-20/+20 °C	1.0 K	70 °C	**TRM 022-301**
0/+40 °C	1.0 K	70 °C	**TRM 40-301**
+10/+50 °C	1.0 K	70 °C	**TRM 150-301**
Switching differential adjustable			
0/+40 °C	3–10 K	70 °C	**TRM 40-303**
+10/+50 °C	3–10 K	70 °C	**TRM 150-303**

-version · Degree of protection EEx de IIC T6

Range of adjustment	*Switching diff. (Mean value)*	*Max. allowable temperature on sensor*	*Type*
Switching differential not adjustable			
-20/+20 °C	1.0 K	60 °C	**Ex-TRM 022**
0/+40 °C	1.0 K	60 °C	**Ex-TRM 40**
+10/+50 °C	1.0 K	60 °C	**Ex-TRM 150**

Type series TAM

Capillary tube thermostats with 1.5 m capillary tube

The sensor cartridge at the end of the capillary tube is the actual active (temperature-sensitive) part of the sensor. Changes in temperature on the capillary tube have no effect on the switching point.
Pressure -tight installation of the sensor in pressure vessels of all kinds is possible with the aid of immersion tubes.

Immersion tubes R….

TAM 490-301

Range of adjustment	*Switching diff. (Mean value)*	*Max. allowable temperature on sensor*	*Type*
Switching differential not adjustable			
-20/+20 °C	1.5 K	110 °C	**TAM 022-301**
+10/+50 °C	1.5 K	110 °C	**TAM 150-301**
+40/+90 °C	2.0 K	125 °C	**TAM 490-301**
+80/+130 °C	2.0 K	150 °C	**TAM 813-301**

-version · Degree of protection EEx de IIC T6

Range of adjustment	*Switching diff. (Mean value)*	*Max. allowable temperature on sensor*	*Type*
-20/+20 °C	1.5 K	110 °C	**Ex-TAM 022**
+10/+50 °C	1.5 K	110 °C	**Ex-TAM 150**
+40/+90 °C	2.0 K	125 °C	**Ex-TAM 490**
+80/+130 °C	2.0 K	150 °C	**Ex-TAM 813**

Type series TX

Rod thermostats (without immersion tube)

TX 023-301

Rod thermostats can be installed as immersion thermostats in pipelines and containers and for monitoring temperature in air ducts. **The suitable immersion tube has to be chosen according to the application.**

Range of adjustment	*Switching diff. (Mean value)*	*Max. allowable temp. on sensor*	*Immersion depth (mm)*	*Type*
–20/+30 °C	1.5 K	110 °C	135	**TX 023-301**
+10/+50 °C	1.5 K	110 °C	135	**TX 150-301**
+40/+90 °C	2.5 K	125 °C	135	**TX 490-301**
+80/+130 °C	4.0 K	150 °C	135	**TX 813-301**
–20/+30 °C	1.5 K	110 °C	220	**TXB 023-301**
+10/+50 °C	1.5 K	110 °C	220	**TXB 150-301**
+40/+90 °C	2.5 K	125 °C	220	**TXB 490-301**
+80/+130 °C	4.0 K	150 °C	220	**TXB 813-301**

Ex-TX 150

Ex-version · Degree of protection EEx de IIC T6

Range of adjustment	*Switching diff. (Mean value)*	*Max. allowable temp. on sensor*	*Immersion depth (mm)*	*Type*
–20/+30 °C	1.5 K	110 °C	135	**Ex-TX 023**
+10/+50 °C	1.5 K	110 °C	135	**Ex-TX 150**
+40/+90 °C	2.5 K	125 °C	135	**Ex-TX 490**
–20/+30 °C	1.5 K	110 °C	220	**Ex-TXB 023**
+10/+50 °C	1.5 K	110 °C	220	**Ex-TXB 150**
+40/+90 °C	2.5 K	125 °C	220	**Ex-TXB 490**

Type series STB

Temperature monitors, temperature limiters component tested

The temperature monitors and temperature limiters correspond to the requirements of DIN 3440 and can thus be used for heating systems according to DIN 4751, for steam and hot water systems and for district heating systems. The devices with safety function (STW, STB) are self-monitoring, i. e. in the case of breakage or leaks in the measuring system, the circuit is opened and the system is switched off to the safe side.

Type summary

Setting range	*Max. temperature at the probe*	*Immersion depth (mm)*	*Type*
20–150 °C	175 °C	150	**STW 1 F**
20–150 °C	175 °C	150	**STW + TRF**
30–110 °C	130 °C	150	**STB + TWF**
30–110 °C	130 °C	150	**STB + TRF**
60–130 °C	150 °C	150	**STB 1 F**
20–150 °C	175 °C	100	**TWP 1 F**

Housing
Aluminium diecasting with plastic cover

Immersion tube (included in supply): brass
Screw-in thread: G ½″
Immersion depth: see type overview

Switching capacity
10 (2) A, 250 VAC

Type of protection IP 54

Immersion tubes

Temperature monitor, temperature limiter	*TÜV-test certificate*	*Immersion depth*	*Type*
STB 1 F	STB 89 501	150 mm	**T 4 NST F**
TWP 1 F	TW 89 201		
STW 1 F	STW (STB) 89 401 S		
STB + TW F	TW/STB 90 401	150 mm	**T 5 NST F**
STB + TR F	TR/STB 90 001		
STW + TR F	TR/STW (STB) 89 901 S		

Type series T69

Frost protection thermostats

T69

The Single Stage Thermostat series T6950A/51A/60A/61A provides the antifreeze function. Designed for systems where temperature may not drop under a certain fixed safety value such as:

- Reheaters in air conditioning systems
- Heat exchanger in cooling systems
- Gas-filled copper sensible element with 1.8 m bulb length or 3 m and 6 m coil length
- Dust-tight (Honeywell) micro switch the switching contacts (heat/cool)
- Protection class I (T6950/51) according EN60335-1, IP40 according EN60529
- Easy installation and wiring
- Manual Reset (T6950/60), Automatic Reset (T6951A/61A)
- all 1.8 m versions with immersion bulb

Range of adjustment
–10 °C…+12 °C

Max. overload temperature
200 °C (max. 60 min.)

Housing material
ABS and corrosion protected steel (IP65 Macrolon)

Switching capacity
24…250 VAC; 18 (8) A

Hysteresis
1 K

Frost protection thermostats

Type of protection IP	*Length of capillary tube m*	*Type*
40	1.8 m	**T6951A1009**
40	3.0 m	**T6951A1017**
40	6.0 m	**T6951A1025**
65	1.8 m	**T6961A1007**
65	3.0 m	**T6961A1015**
65	6.0 m	**T6961A1023**

Frost Protection Limiter (with internal interlock)

Type of protection IP	*Length of capillary tube m*	*Type*
40	1.8 m	**T6950A1000**
40	3.0 m	**T6950A1018**
40	6.0 m	**T6950A1026**
65	1.8 m	**T6960A1008**
65	3.0 m	**T6960A1016**
65	6.0 m	**T6960A1024**

Type series FT

Frost protection thermostats for air heating and conditioning systems

FT015

- large service friendly plug
- easy check of correct connection by removing the plug

If the temperature falls below the set value over a min. length of 3–5 cm, the thermostat switches off. A fixed stop on the setting spindle at 4 °C prevents the thermostat from being set below the freezing point due to in expert adjustment. If the capillary tube is damaged or broken, the Fema frost protection thermostats reliably switch off towards the safe side (e. g. fan off), irrespective of the temperature at the sensor. Capillary tube holders H 3 are included.

Plug connection to DIN 43650

Range of adjustment	*Max. temperature on sensor*	*Version*	*Type*
4–15 °C	200 °C	6 m capillary tube	**FT 015**
4–15 °C	200 °C	3 m capillary tube	**FTB 015**
Version with manual reset			
4–15 °C	200 °C	6 m capillary tube	**FT 015-206**
4–15 °C	200 °C	3 m capillary tube	**FTB 015-206**

Ex -version · Degree of protection EEx de IIC T6

4–15 °C	200 °C	6 m capillary tube	**Ex-FT 015**
4–15 °C	200 °C	3 m capillary tube	**Ex-FTB 015**

Two-phase frost protection control system with output signal 0–10 V and limit switch.

Type series TKM

Strap-on thermostats for underfloor heating

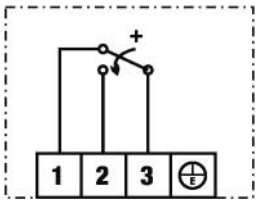
TKM 50-315

Self-monitoring

Features

- Self monitoring sensor
- Solid, robust housing
- Easy installation
- Heat compound and tension band ½″ to 2″ included

Connection diagram



Description

The fast responding sensor system is also self-monitoring. If the sensor is broken or damaged, the thermostat behaves as though the temperature had exceeded the set value it switches off towards the safe side (e.g. circulating pump off). The response sensitivity can be improved by using a heat conducting compound between the pipe and the contact face of the sensor. Heat conducting compound is included with each unit.
It is important that the surface of the pipe is carefully cleaned and free from dirt, scale and paint before fitting the sensor. The tension band included with each thermostat enables the contact thermostats to be attached to pipes of nominal diameters ½″ to 2″.

Type selection for underfloor heating applications

The switching point should be 10 K above the temperature of the underfloor heating systems.

Technical data

Casing	Aluminium die-cast GD AlSi 12 according to DIN 1725. Terminal box lid made of glass fibre reinforced plastic.
Mounting position	Optional
Fitting	With tension band directly on the pipe. Suitable for nominal diameters of pipe from ½″ to 2″.
Max. Ambient temperature	70 °C
Max. Temperature at the sensor	100 °C
Switching temperature	Adjustable with screwdriver after removal of the terminal box cover. For ranges see summary of types.
Switching differential	Not adjustable. For values see summary of types.
Contact complement	Single-pole changeover. Two-pole version on enquiry.
Switching capacity	8 (5) A 250 VAC
Type of protection	IP 54 according to DIN 40050 (in case of vertical mounting)
Connection	3-pole terminal strip and earth conductor connection. Accessible after removal of the terminal box cover. Cable entry Pg 11, max. cable diameter 10 mm.
Adjustment	The specified setting values relate to the upper switching point (with rising temperature). The lower switching point (with falling temperature) is lower by the switching differential.

Summary of types

Range of adjustment	*Switching differential (Mean Values)*	*Factory-set at*	*Type*
45–50 °C	6 K	50 °C	**TKM 50-315**
55–60 °C	6 K	60 °C	**TKM 60-315**
65–70 °C	6 K	70 °C	**TKM 70-315**

Industrial Room Thermostats

Single and Dual Stage Industrial Room Thermostats T6120 A/B

General Application

The T6120A and B Single- and Dual-Stage Industrial Room Thermostats are designed for measuring, monitoring, and controlling temperatures in heating and cooling systems. These thermostats are suitable for the following areas of applications.

- commercial buildings
- garages
- factories
- storage rooms
- machine rooms
- greenhouses and
- agricultural installations

Technical data	T6120A1005	T6120B1003
Max. current	10 (1,5) A, 250 VAC	15 (8) A, 24…250 VAC
Max. bulb temperature	+65 °C	+60 °C
Switching differential	1 °C	1 °C
Protection standard	IP 54	IP 65
Weight	360 g	530 g
Difference between 2 stages	–	2…10 K
Housing material	glass fibre reinforced ABS	
Electrical connection	Screw terminal block for wiring up 1,5 mm^2	

T6120A1005

Order No.	*Stage*	*Housing temperature*	*Temperature range*
T6120A1005	single	-10…+65 °C	0…+40 °C
T6120B1003	dual	-15…+60 °C	-30…+30 °C

Wiring and function T6120A1005

Heating
Connect terminal 2 and terminal 3. The contact opens while the temperature is increasing.

Cooling
Connect terminal 1 and 2. The contact opens while the temperature is decreasing.

Wiring and function T6120B1003

Heating
Connect Red (common) to blue terminal; the contact opens
while rising of the temperature in the following sequence: Stage 2, Stage 1.

Cooling
Connect Red (common) to white terminal; the contact opens
while dropping of the temperature in the following sequence: Stage 1, Stage 2.

Differential setting

Switching differential between both stages can be adjusted by a inside setpoint lever mounted below the mircro switch “stage 2”.
Turning the lever to the sensor side means – increase of switching differential
Turning the lever to the cable entry side means – degrease of switching differential

Hygrostats

Duct and Room Hygrostats H6045, H6120

H6045A1002

General Application

The H6045A1002 Single-Stage Duct Hygrostat and the H6120A1000 Single-Stage Room Hygrostat are designed for monitoring relative humidity in air conditioning systems and climatic cabinets as well as for controlling air humidifiers and dehumidifiers for dehumidification control in Indoor swimming pools. Further areas of application include storage rooms for foodstuffs, the textiles industry, paper industry, printing shops, the film industry, greenhouses, hospitals and wherever air humidity levels must be monitored.

Technical data

Specification	*H6045A1002 Duct Hygrostat*	*H6120A1000 Room Hygrostat*
Humidity range	35…100 % r. H.	35…100 % r. H.
Switch load	15 (8) A, 24…250 VAC	5 (0.2) A, 230 VAC
Contact	single-pole	single-pole
Max. working temperature	-10…+65 °C	0…+60 °C
Max. air-flow speed	8 m/s	15 m/s
Protection standard	IP 65	IP 30
Protection class	I	I
Tolerance	max. 4 % r. H.	max. 3 % r. H.
Switching hysteresis	5 % r. H.	4 % r. H.
Housing material	ABS glass fiber reinforced	ABS (white)
Weight	480 g	125 g

H6120A1000

Mounting and Switch Point Adjustment

H6045A1002
The H6045A1002 Duct Hygrostat can be installed directly onto air ducts using the attached mounting bracket.

H6120A1000
The H6120A1000 Room Hygrostat must be mounted far from heat sources and must be freely accessible for air convection at a height of approx. 1.5 meters.

Switch Point Adjustment
The switch point can be adjusted using the knob located on the top of the device. The easily readable scale and the pointer on the housing surface facilitate adjusting the humidity level.

Honeywell

Flow Monitoring

Paddle Flow Switches for Air- and Liquid Flow

Paddle Air & Liquid Flow Switches S6040A and S6065A

S6040

General

The air and liquid flow switches of the **S6040 and S6065A** series are designed for monitoring flow rates in pipes and ducts employed in HVAC applications.

The **S6040A1003** Air Flow Switch monitors air flow and the flow of non-aggressive gases in air ducts of air conditioning systems and air treatment systems.

The liquid flow switches of the S6065A series are suitable for monitoring flow in water, oil, cooling circuits, and lubrication systems.

The S6065A2001 is designed for monitoring aggressive liquids. Table 1 on page 2 presents the reset and switch points for water. Data for other media must be determined empirically.

Common technical data

Switching capacity	15 (8) A, 24…250 VAC
Working temperature	–40…+85 °C.
Electrical connection	Screw terminals, wire up to 1,5 mm^2 cable, Ø 6–9 mm
Protection Class	I
Protection Standard	IP 65
Housing material	ABS and corrosion protected steel

S6065A1003

Models

Specification	*S6040A1003*	*S6065A1003*	*S6065A2001*
Flow medium	air	non-aggressive liquid	aggressive liquid
Mounting	vertically through a 20 mm hole in the duct; mount paddle inside	Rp 1″ (ISO 7/1)	Rp 1″ (ISO 7/1)
Maximum duct/ pipe temperature	85 °C	120 °C	120 °C
Pressure	0.25 bar	11 bar	30 bar
Paddle material	1.4301	1.4401	1.4401
Lever	yellow brass	yellow brass	1.4404
Sensor body	zinc-plated steel	yellow brass	1.4404
Housing dimensions	108 x 70 x 72 mm	113 x 70 x 65 mm	108 x 70 x 72 mm
Weight	700 g	850 g	850 g
Approvals	–	TÜV-approved	TÜV-approved

Type series SWW

Flow monitoring in liquids and gases

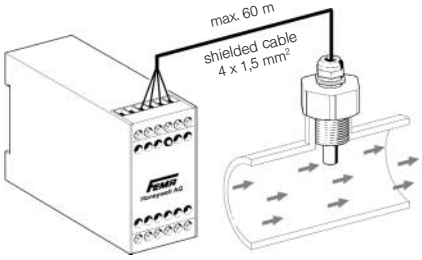
The flow in fluids can be monitored reliably with the flow sensor SWF 62 and the evaluation unit ASW…
The sensitivity can be adjusted accurately with a coarse and fine potentiometer. The switching state is indicated by LED. The sensor element must be located in the flow.

Technical data

Materials In contact with medium: stainless steel 1.4571
Sealing compound: Wepuran (vu 4459/41 sv)
Cable screw union: Ms nickel-plated
Cable length 2,5 m
Degree of protection IP 65 (Sensor), IP 32 (evaluation unit)
Medium temperature 0…80 °C (compensated range), max. permissible to 120 °C.

Evaluation unit

Switching output Relay 8 A, 250 VAC
Power consumption app. 3 VA
Sensitivity 0.1…3 m/s in fluid media,
1…15 m/s in gaseous media
Delay time approx. 10–60 s
Probe breakage protection On breakage or interruption
Type of construction Standard housing N 45



Type summary	*Screw-in thread*	*supply voltage*	*Type*
Sensor	G ¼″		**SWF 62**
	G ½″		**SWF 62L**
Evaluation units		230 VAC	**ASW 454**
		24 VAC / DC	**ASW 454 / 24**

Type series KSW

Flow monitoring

Compact Electronic Air and Liquid Flow Switch

The high reliable Compact Electronic Flow Switches are designed for detecting water Flow in pipes.
As soon as medium flow speed exceeds or falls under a customer adjusted value, the device will switch a electric cirquit.

Technical data

Sensor materials in contact with medium; Stainless steel 1.4305
Sealing compounds: Wepuran (vu4459/41sv)
Process Connection G ½″
Housing IP 65
Medium temperature -10…+ 80°C
Temperature compensation: 80 °C, Temp. (up to 120 °C) may cause a deviation of the switching point, but cannot destroy the sensor.
Max. Pressure 30 bar
Power supply 230 VAC, 24 VAC / DC
Contact Load relay, single pole, double tap (SPDT) 250 VAC, 10 (2) A
Range 0,05…3 m/s
Response time 1–10 s on Flow speed
Sensor protection In case of failure of sensor or power supply and shortcut, the relay will switch off (to the safe side)

KSW 230

Type summary	*Supply voltage*	*Type*
	230 VAC 24 VAC / DC	**KSW 230** **KSW 24**

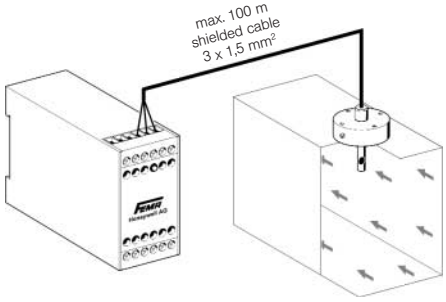
Type series SWL

Air flow monitoring

While the plant is being started up (still no airflow present), the output contact is activated and the flow condition signalled. The time for the **switch-on bypass** is adjustable from 2-60 s.

Technical data

Depth of immersion	35 mm
Degree of protection	IP 32
Medium temperature	–20. . .+120 °C
Evaluation unit	
Switching output	Relay 8 A, 250 VAC
Power consumption	approx. 3 VA
Sensitivity	0.1…20m/s
Delay time	approx. 1 s
Probe breakage protection	On breakage or interruption
Type of construction	Standard housing N45



Type summary	*Supply voltage*	*Type*
Sensor (with flange)		**SLF 3**
Evaluation units	230 VAC	**ASL 453**
	24 VAC / DC	**ASL 453 / 24**

Type series KSL

Air flow monitoring

Compact Electronic Air and Liquid Flow Switch
The high reliable Compact Electronic Flow Switches are designed for detecting air flow in ducts.

As soon as medium flow speed exceeds or falls under a customer adjusted value, the device will switch a electric cirquit.

Technical data

Sensor	Fast acting air flow sensor with adjustable air duct mounting flange. The sensing element is insensitive to humidity. (Cleaning of the sensor element with flow water is possible.)
Immersion depth	130 mm
Housing IP	IP 65
Medium temperature	–20…+80°C
Temperature compensation	Fast, latest 0,3 sec after change of temperature
Sensor material	MS58 Nickel plated
Max. Pressure	10 bar
Power supply	230 VAC, 24 VAC / DC
Contact load	Relais, single pole, double tap (SPDT), 250 VAC, 10 (2) A
Response time	1…10 sec. depending on Flow speed
Sensor protection	In case of mechanical failure of sensor or power supply and shortcut, the relais will switch off (to the safe side).

KSL 230

Type summary	*Power supply*	*Type*
	230 VAC	**KSL 230**
	24 VAC / DC	**KSL 24**

Honeywell

Solenoid Valves

Solenoid valves, coupled, also in Ex

Technical data overview

Fema piston-type solenoid valves are suitable for exacting fields, especially in the field of heat, energy and gas technology. All the below mentioned product groups are coupled and therefore used from **0 bar to maximal pressure**, a minimum differential pressure is not necessary. A DC coil is universally used. For connection to an AC supply of 230 V, a rectifier is be supplied. The rectifier is installed at the plug connection. The valves are to be used in correct direction of flow only. If flow is reversed, valves will not close completely. The valves need to be operated once per month for correct functioning.

Series Application	Nom. diameter DN (mm)	M= Sockets F= Flange	Working pressure* (bar)	Seals Piston	Nozzle	Static Seal	Temperatures Medium °C	Environ-ment °C	N= Normal-type Ex = Ex-type	Opera-ting modes	Testing agency DIN
TG **for neutral media**	15/20 25/32 40/50	M + F M + F F	0–40 0–32 0–20	NBR	NBR	NBR	-15 to + 90 60°C at Ex	-15 to + 60	N + Ex	nc + no	
TGK **for high temperatures**	15/20 25/32 40/50	M + F M + F F	0–40 0–32 0–20	PTFE	stainl. steel conne	EPDM	max. 180	-15 to + 60	N	nc + no	
K **for fuel gases up to 4 bar**	15/20 15/20 25/32 40/50	M F F F	0–4 0–4 0–4 0–4	NBR	NBR	NBR	-15 to +60	-15 to +60	N + Ex	nc	DVGW DIN-EN 161
K **for fuel gases higher than 4 bar**	15/20 25/32 40/50	F F F	0–25 0–25 0–20	NBR	NBR	NBR	-15 to +60	-15 to +60	N + Ex	nc	DVGW DIN 3394 part 1
K **for liquid gas in liquid phase**	15/20 25	F F	0–25 0–25	NBR	NBR	NBR	-15 to +60	-15 to +60	N + Ex	nc	TÜV DIN 32725 (draft Nov ´92)
K **for fuel oil**	15/20 15/32 40/50	F F F	0–25 0–25 0–20	NBR	NBR	NBR	-15 to +60	15 to +60	N	nc	TÜV DIN-EN 264
LG **for hot water and steam up to 120 °C**	15/20 25/32 40/50	M + F M + F F	0–25 0–20 0–16	PTFE	stainl. steel conne	EPDM	max. 120	+4 to +60	N	nc	TÜV DIN 32730
LGK **for hot water and steam up to 180 °C**	15/20 25/32 40/50	M + F M + F F	0–20 0–16 0–12	PTFE	stainl. steel conne	EPDM	max. 180	+4 to +60	N	nc	TÜV DIN 32730

nc = normally closed, opened under voltage.
no = normally open, closed under voltage (identified in the type review by “U”).
* = The respective data sheet contains exact details of the limits of use.

Sealing materials:
NBR = Buna N (Perbunan)
EPDM = Ethylene – propylene – rubber
PTFE = Teflon

Certificates to EN 10 204/Documents

WZ 2.2	Test report 2.2 type series certificate
AZ 3.1 B-M	AZ 3.1 B inspection certificate specific product test
DOKU	**Documents:** additional documents, e.g. data sheets, mounting, instructions, TÜV-, DVGW- or PTB-certificate.

Solenoid valves

Technical data

Type	2/2-way
Type of construction	Piston-type solenoid valve, coupled, **minimum differential pressure not necessary**
Materials	Casing: Bronze Rg 5 to DIN 1705, Internal parts: Brass (CuZn) and corrosion-resistant steel, Sealing: Perbunan (normal version)
Mounting position	Solenoid system upright
Magnet System / electr. connection	The standard magnet systems have DC coils. For AC connections a built-in rectifier is supplied with the valve. The magnet coil is cast into silicone rubber (a moisture protection)
Operating voltage	230 VAC, 50 Hz
Degree of protection	IP 65 to DIN 40 050, fr = suitable for outdoor use
Power Requirement	about 47 VA (with the magnet warmed)
Duty Cycle	100 % ED
Degree of protection on Ex-versions	Pressure proof capsule EEx de IIC T5 (PTB-No. Ex-85/1063). Suitable for ≥ Zone 1 and 2 areas

Pressure ranges as well as medium resp. ambient temperatures see type overview.

Type series TG

Solenoid valves for universal application

The piston type solenoid also can open and close even in the pressureless state and with low differential pressures. Ambient temperature –15 °C up to 60 °C. Temperature of medium up to 90 °C (120 °C). Degree of protection IP 65. (Rectifier is built into the connection plug).

Operating mode: normally closed, on desire, normally open.

T15G31M

DN (mm)	*k_{VS}-value (m^3/h)*	*Working pressure (bar)*	*Internal thread*	*Type*
Operating mode: normally closed				
15	4.0	0–30	G ½″	**T15G31M**
20	4.8	0–30	G ¾″	**T20G31M**
25	10.0	0–25	G 1″	**T25G31M**
32	13.0	0–25	G1¼″	**T32G31M**
15	4.0	0–30		**T15G31F**
20	4.8	0–30		**T20G31F**
25	10.0	0–25		**T25G31F**
32	13.0	0–25	Flange	**T32G31F**
40	34.0	0–16		**T40G31F**
50	40.0	0–16		**T50G31F**

Type series TG-Ex

Solenoid valves in ⟨Ex⟩ -version

Suitable for explosion hazardous rooms (≥ zone 1). Pressure proof encapsulated (EEx de IICT5) PTB-No. Ex-85/1063. Maximum medium resp. ambient temperature 60 °C. Rectifier is built into the connection plug.

Operating mode: normally closed, on desire, normally open.

T32G35F-Ex

DN (mm)	*k_{VS}-value (m^3/h)*	*Working pressure (bar)*	*Internal thread*	*Type*
Operating mode: normally closed				
15	4.0	0–30	G ½″	**T15G35M-Ex**
20	4.8	0–30	G ¾″	**T20G35M-Ex**
25	10.0	0–25	G 1″	**T25G35M-Ex**
32	13.0	0–25	G 1¼″	**T32G35M-Ex**
15	4.0	0–30		**T15G35F-Ex**
20	4.8	0–30		**T20G35F-Ex**
25	10.0	0–25		**T25G35F-Ex**
32	13.0	0–25	Flange	**T32G35F-Ex**
40	34.0	0–16		**T40G35F-Ex**
50	40.0	0–16		**T50G35F-Ex**

Type series K

Solenoid valves for gas, liquid gas and liquid fuels

DIN-DVGW
DIN-EN

Suitable for all gases according DVGW-data sheet G 260, for liquid phase (up to DN 25) and for fuel oil. Minimum differential pressure is not necessary. The solenoid valves are also available with a pressure-tight solenoid system (Protection Class EEx de IIC T5, PTB-No. Ex-85/1063)

Operating mode: normally closed.

DN (mm)	*k_{VS}-value* (m^3/h)	*Working pressure* (bar)	*Nominal pressure* PN	*Con-nection*	*Registration*	*Valves class*	*Type*
15	4.0	0–4		G ½″	1, 5	B	**K15G31M**
20	4.8	0–4		G ¾″	1, 5	B	**K20G31M**
15	4.0	0–25	40	Flange	1, 2, (3), 4, 5, 6	B	**K15G31F**
20	4.8	0–25	40		1, 2, (3), 4, 5, 6	B	**K20G31F**
25	10.0	0–25	40		1, 2, (3), 4, 5, 6	B	**K25G31F**
32	13.0	0–25	40		1, 2, 4, 5, 6	B	**K32G31F**
40	34.0	0–20	25		1, 2, 4, 5, 6	C	**K40G31F**
50	40.0	0–20	25		1, 2, 4, 5, 6	C	**K50G31F**

K25G31F

-version

15	4.0	0–4		G ½″	1, 5	B	**K15G35M-Ex**
20	4.8	0–4		G ¾″	1, 5	B	**K20G35M-Ex**
15	4.0	0–25	40	Flange	1, 2, (3), 4, 5, 6	B	**K15G35F-Ex**
20	4.8	0–25	40		1, 2, (3), 4, 5, 6	B	**K20G35F-Ex**
25	10.0	0–25	40		1, 2, (3), 4, 5, 6	B	**K25G35F-Ex**
32	13.0	0–25	40		1, 2, 4, 5, 6	B	**K32G35F-Ex**
40	34.0	0–20	25		1, 2, 4, 5, 6	C	**K40G35F-Ex**
50	40.0	0–20	25		1, 2, 4, 5, 6	C	**K50G35F-Ex**

K25G35F-Ex

Registrations:

Type series	*Test Standard*	*Reg.-Number*	*Notified Body*
K15G35F-Ex, K20G35F-Ex, K25G35F-Ex, K32G35F-Ex, K40G35F-Ex, K50G35F-Ex	DIN EN 161	CE-0085AN0073	DVGW
K15G31F, K20G31F, K25G31F, K32G31F, K40G31F, K50G31F	DIN EN 161	CE-0085AN0072	DVGW
K15G31M, K20G31M,	DIN EN 161	CE-0085AN0074	DVGW
K15G35M-Ex, K20G35M-Ex	DIN EN 161	CE-0085AN0075	DVGW
K15G31F, K20G31F, K15G35F-Ex, K20G35F-Ex, K15G31M, K20G31M K15G35M-Ex, K20G35M-Ex	DIN EN 264	5S038/97	DIN CERTCO
K25G31F, K25G35F-Ex, K32G31F, K32G35F-Ex	DIN EN 264	5S039/97	DIN CERTCO
K40G31F, K50G31F, K40G35F-Ex, K50G35F-Ex	DIN EN 264	5S040/97	DIN CERTCO
K15G31F, K20G31F, K15G35F-Ex, K20G35F-Ex	DIN 32725 E	Test Nr. S 78/95	TÜV
K25G31F, K25G35F-Ex,	DIN 32725 E	Test Nr. S 79/95	TÜV
Valves K…F	Ü, List A, T. 1, 95/1	Test Nr. S 162/95	TÜV

Type series TG-K

Solenoid valves for medium temperature up to 180 °C

T40G31FK

The piston-type solenoid valves of the TGK series are suitable for hot water, steam, fuel oil and other non-aggressive media up to a temperature of 180 °C.

Operating mode: normally closed, on desire normally open.

DN (mm)	*k_{VS}-value (m^3/h)*	*Working pressure (bar)*	*Internal thread*	*Type*
15	4.0	0–25	G ½″	**T15G31MK**
20	4.8	0–25	G ¾″	**T20G31MK**
25	10.0	0–20	G 1	**T25G31MK**
32	13.0	0–20	G 1¼″	**T32G31MK**
15	4.0	0–25		**T15G31FK**
20	4.8	0–25		**T20G31FK**
25	10.0	0–20		**T25G31FK**
32	13.0	0–20	Flange	**T32G31FK**
40	34.0	0–16		**T40G31FK**
50	40.0	0–16		**T50G31FK**

Type series LG

Solenoid valves for hot water and steam up to 120 °C/180°C

Tested to DIN 32730

L25G31F

Fema piston-type solenoid valves of the LG series are particularly suitable for use as stop and safety check valves in heating installations up to 120 °C resp. 180 °C. The coupled (automatically servo-controlled) mode of operation does not require a minimum differential pressure; the units can open and close perfectly even in the pressureless state and with low differential pressures.

Operating mode: normally closed.

DN (mm)	*k_{VS}-value (m^3/h)*	*Working pressure (bar)*	*Internal thread*	*Max. medium temperature*	*Type*
15	4.0	0–25	G ½″		**L15G31M**
20	4.8	0–25	G ¾″		**L20G31M**
25	10.0	0–20	G 1	120 °C	**L25G31M**
32	13.0	0–20	G 1¼″		**L32G31M**
15	4.0	0–25			**L15G31F**
20	4.8	0–25			**L20G31F**
25	10.0	0–20			**L25G31F**
32	13.0	0–20	Flange	120 °C	**L32G31F**
40	34.0	0–16			**L40G31F**
50	40.0	0–16			**L50G31F**
15	4.0	0–20	G ½″		**L15G31MK**
20	4.8	0–20	G ¾″		**L20G31MK**
25	10.0	0–16	G 1	180 °C	**L25G31MK**
32	13.0	0–16	G 1¼″		**L32G31MK**
15	4.0	0–20			**L15G31FK**
20	4.8	0–20			**L20G31FK**
25	10.0	0–16			**L25G31FK**
32	13.0	0–16	Flange	180 °C	**L32G31FK**
40	34.0	0–12			**L40G31FK**
50	40.0	0–12			**L50G31FK**

Registration

Type series	*Test Standard*	*Reg.-No.*	*Notified Body*
L15G31MK, L15G31FK, L20G31MK, L20G31FK	DIN 32730	1F01999	DIN CERTCO
L25G31MK, L25G31FK, L32G31MK, L32G31FK	DIN 32730	1F02099	DIN CERTCO
L40G31FK, L50G31FK	DIN 32730	1F02199	DIN CERTCO
L15G31M, L15G31F, L20G31M, L20G31F	DIN 32730	1F02299	DIN CERTCO
L25G31M, L25G31F, L32G31M, L32G31F	DIN 32730	1F02399	DIN CERTCO
L40G31F, L50G31F	DIN 32730	1F02499	DIN CERTCO
Valves L…F	Ü, List A, T. 1, 95/1	Test No. S 160/95	TÜV

Accessories for Solenoid Valves

for valves

Operating mode

If not identified specially, the valves are delivered with **"closed at zero current"** mode of operation.
Operating mode **"open at zero current"** (possible only for valves of the TG, TGK and TG-Ex series)

	Sign
in normal versions (e. g. in TG and TGK)	**U**
in Ex-version (type serie TG-Ex)	**U**

Identification by additional letter "U".

Ordering example: T25G31FU.

Special voltages

for normal and Ex solenoids

Special voltages	**Ident.-No.**
24 VDC	**6**

In the case of alternating voltages, a rectifier of corresponding capacity must be provided by the customer.

Ordering example: K 20 G 31 F6 (24 VDC).

Replacement solenoids

	Type
Normal version without rectifier, without plug	**G 31**
with device socket GS incl. rectifier (for 230 VAC)	**G 31 GS**
Ex-version	
without rectifier	**G 35-Ex**
Ex-version with rectifier (only for 230 VAC)	**G 35-Ex G**

Rectifier/plug

The suitable rectifiers are enclosed for all plunger solenoid valves which are ordered for 230 V.

	Type
Device socket with built-in rectifier Primary 230 VAC, 50 Hz Secundary approx. ca. 230 VAC	**GS**

Type series GB

Solenoid valves for gaseous and liquid media

normally closed, also in stainless steel 1.4410

This range of solenoid valves is of high quality and suitable for universal application, and is **not dependent operationally on a specific minimum differential pressure;** the valves operate correctly with no pressure, at slight differential pressure, and right through to maximum pressure. They are therefore the valves of choice for installation **in plants where differential pressures fluctuate greatly and are not possible to determine precisely in advance.** The valves are also suitable **for use in heating and cooling circuits.**

Medium temperature
–10…+90 °C

Operating voltage
230 VAC, 50 Hz

Vacuum resistance
up to –0.9 bar.

DN (mm)	*k_{VS}-value (m^3/h)*	*Pressure range (bar)*	*Threaded connection*	*Type*
Brass valve body, internal parts stainless steel; Sealings: Perbunan (NBR)				
12	2.8	0–16	G ½″	**GB 12**
20	5.0	0–16	G ¾″	**GB 20**
25	10.0	0–16	G 1	**GB 25**
Stainless steel 1.4410 valve body, internal parts stainless steel; Sealings: Viton				
12	2.8	0–16	G ½″	**GB 12 VA**
20	5.0	0–16	G ¾″	**GB 20 VA**
25	10.0	0–16	G 1	**GB 25 VA**

Special voltages	*Ident.-No.*
110 VAC	2
24 VAC	8
24 VDC	6

ST 219: Device plug with LED-display for voltage 12 V – 24 VAC/DC
ST 220: Device plug with LED-display for voltage 100 V – 120 VAC/DC
ST 221: Device plug with LED-display for voltage 200 V – 240 VAC/DC

Type series AB and AV

Solenoid valves for neutral liquid media normally closed

Medium temperature
–10…+90 °C (AB)
0…+90 °C

Sealing
Perbunan (NBR)

The Solenoid Valve series AV is designed for **Safety function in accordance with DIN EN 264 (Registration No. 5S235/2000)** for Heating liquid fuel EL supply systems.

The AB-series are suitable for neutral media such as water and hydraulic oil. They operate without minimum differential pressure.

DN	*k_{VS}-value (m^3/h)*	*Pressure range (bar)*	*Threaded connections*	*Weight (kg)*	*Type*
Brass valve body, Membrane: Perbunan (NBR)					
10	1.8	0–10	G ⅜″	0.4	**AB10**
13	3.5	0–10	G ½″	0.55	**AB13**
20	8.6	0–10	G ¾″	1	**AB20**
25	11	0–10	G 1″	1.7	**AB25**
25	11	0–10	G 1¼″	1.7	**AB32**
40	30	0–10	G 1½″	3.5	**AB40**
40	30	0–10	G 2″	3.5	**AB50**

The solenoid valves **series AV** are designed for safety function in liquid fuel supply systems. The valves prevent unintended draining of the system and storage tanks in case of malfunction of burner or filter.

Brass valve body, Sealing: Viton					
10	1.8	-0.9–4	G ⅜″	0.4	**AV102MS2**
13	3.5	-0.9–4	G ½″	0.55	**AV131MS2**
20	8.6	-0.9–10	G ¾″	1	**AV201MS2**
25	11	-0.9–10	G 1″	1.7	**AV251MS2**
25	11	-0.9–10	G 1¼″	1.7	**AV252MS2**
40	30	-0.9–10	G 1½″	3.5	**AV401MS2**
40	30	-0.9–10	G 2″	3.5	**AV402MS2**

Device plugs see series GB.

Type series GK

Solenoid valves for neutral media up to 180 °C

Technical data

Version	2/2-way normally closed
Design	Piston valve, balanced, **no minimum pressure required**
Materials	Screwed version: brass Flange version: cast iron GG 25
Gasket material	PTFE and graphite
Media	neutral media, e. g. hot water and steam
Medium temperature	0–180 °C
Ambient temperature	max. 55 °C
Operating pressure	0–10 bar
Viscosity	max. 21 mm/s
Line connection	G ½″ up to G 2, Flange (PN 16) for DN 25–DN 50
Operating voltages (± 10 %)	230 VAC, 50 Hz; 24 V, 50 Hz; 120 V, 60 Hz
Duty cycle	100 %
Electrical connection	Angled plug to DIN 43 650
Power consumption	start: 100 VA operation: 35 VA, DN 50: 30 W
Degree of protection	IP 65
Installation position	preferably solenoid coil upwards
Switching times (standard values)	**opening** DN 15–DN 25: 100–400 ms DN 32–DN 50: 200–1200 ms **closing** DN 15–DN 25: 300–500 ms DN 32–DN 50: 1000–3000 ms

The GK series piston-type solenoid valves are ideal for use as shutoff valves in heating and process engineering systems for neutral media, e. g. hot water and steam.
The valves require no minimum differential pressure.

Type summary

DN (mm)	*k_{VS}-value (m^3/h)*	*Connect*	*Materials*	*Weight (kg)*	*Type*
13	3.7	G ½″	Ms	1.0	**GK 13**
20	5.0	G ¾″	Ms	1.4	**GK 20**
25	10.0	G 1	Ms	1.9	**GK 25**
32	16.0	G 1¼″	Ms	3.2	**GK 32**
40	16.0	G 1½″	Ms	3.7	**GK 40**
50	36.0	G 2	Ms	7.8	**GK 50**
25	10.0	Flange	GG 25	4.6	**GK 25 F**
32	16.0	Flange	GG 25	7.0	**GK 32 F**
40	16.0	Flange	GG 25	7.5	**GK 40 F**
50	36.0	Flange	GG 25	12.8	**GK 50 F**

Special voltages	*Ident.-No.*
110 V, 50 Hz	2
24 V, 50 Hz	8

Ordering example for specially voltages 110 V, 50 Hz: **GK 13-2**

Accessories

Type series AP

Programmable display

Input signals
Freely selectable by setting jumpers. See type summary.

Housing front
48 x 96 mm (DIN)

Actual value display
3½-digit, LED 12.5 mm, red, automatic "–"-sign.

Programmable switching outputs
2 changeover switches

Output relay switching capacity
2 x 230 VAC, 5 A AC

Supply voltage
230 V, 50–60 Hz, 3 VA

Degree of protection (front)
IP 60, DIN 40 050

Working temperature
–10 to +50 °C.

with 2 limit value switches for Pt 100 / Pt 1000 / or voltage and current signals

Routines for setting the following parameters are integrated in the digital display which is controlled by a microprocessor:

- Measuring range (starting and end point)
- Display range (starting and end point)
- Position of the decimal point
- 2 limit values (relays) and their hysteresis
- Drop-down or pull-in delay of the relays
- Enquiry of the minimum and maximum measured value
- Rounding up and down the last digit
- Average formation

All routines and parameters can be set by keys on the front. The switching status of the relays is displayed by LEDs.

Type summary

Input signals (programmable)	*Display range (programmable)*	*Suitable for*	*Type*
0–1 VDC 0–10 VDC 0–20 mA DC	–1999 to +1999	Pressure and temperature transmitter	**APV 630**
Pt 100/Pt 1000	–150 °C to +199.9 °C –200 °C to +800 °C	Temperature sensors Pt 100/Pt 1000	**APT 650**

Type series AZ

Digital LED display for 3-wire transmitters

Display
LED-display, 7 mm high

Display range
–1999…+1999

Supply voltage
24 VAC or 24 VDC
From the basic module by ribbon cable.

Signal voltage:
(input) 0–10 V Signal input through ribbon cable from the evaluation module or from other modules / wire-system.

With the display module AZ, the output of a transmitter from the MODUFLEX system is made visible on a LED display.

The starting and end value of the display can be adjusted between –1999 and +1999, so that an arbitrary display range can be assigned to any pressure range. The decimal point can be switched over with a slide switch.

The y signals of the transmitter can thus be displayed in any arbitrary unit, e. g. V, mA, bar, mbar, %, psi, °C, m, cm (filling height), m^3 , cm^3 (volume) etc.

In addition the display module in its condition on delivery (factor setting 0–10.00) is suitable for the accurate adjustment of the working range of a transmitter.

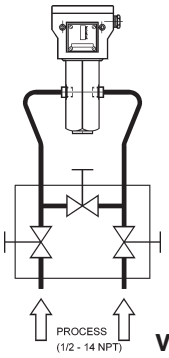
Display 3½-digit –1999…+1999

	Type
3-wire-System	**AZ 331**

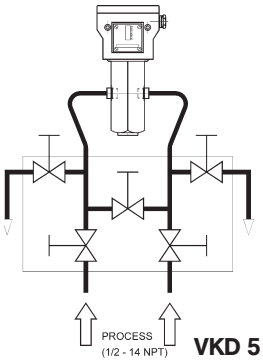
- for pressure transmitter serie F
- for pressure transmitter serie SN 3
- for start-up and service (factory setting 0–10.00)

Type series VKD

Shut-off valve combinations for differential pressure



VKD 3



VKD 5

For differential pressure switches DDCM 014 to DDCM 16 and for differential pressure transmitters serie FHBN…

Technical data

Pressure stage	PN 420
Material	housing high-grade steel 1.4404 inside high-grade steel 1.4571
Sealings	PTFE
Connections	½–14 NPT
Included in delivery	valves, screws and tube

Type summary

	Type
3-venting valves	**VKD 3**
5-venting valves	**VKD 5**

The 5-fold combination contains 2 additional venting valves. The valve combinations are also available free of oil and grease on special request.

Type series Ex V

Isolating switching amplifier

Ex 011

for installation of the thermostats and pressure switches in explosion endangered rooms

Intrinsically safe control commands can be transferred to non-intrinsically safe active circuits with the isolating switching amplifiers. Thus it is possible to use pressure and temperature switches in explosion endangered areas (≥ zone 1).

The isolating switching amplifier must be installed outside the Ex zone.

Ex 041

The Ex 041 isolating switching amplifier is designed additionally in safety technology. The leads between the isolating switching amplifier and pressure or temperature switch are monitored for wire breakage and short circuit. The pressure switch must therefore be equipped with a resistor combination

Ex 041

Type summary

Application	*Suitable for optional functions*	*Equipment*	*Type*
Suitable for all pressure and temperature switches with microswitches and proximity switches	201, 203, 205, 206, 301, 213, 513	Without short circuit monitoring	**Ex 011**
Isolating switching amplifier in safety technology. Suitable for maximum pressure limiting devices with resistor combination and for the pressure limiting devices FD… and DBS	574, 575, 576, 577, FD 16…	With wire breakage and short circuit monitoring	**Ex 041**

Siphons

Siphons to DIN 16282 made of seamless steel tube 20 mm Ø

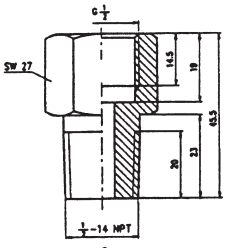
U-shape (FORM B)

FORM B	*Material*	*Type*
Inlet: Weld-on end with weld chamfer **Outlet:** Connection shank DIN 16 282 Form 6 G ½″ with clamping sleeve DIN 16 283 G ½″	St 35.8-I 1.4571	**U 430 B** **U 480 B**

Circlar (FORM D)

FORM D	*Material*	*Type*
Inlet: Weld-on end with welding bevel **Outlet:** Connection shank DIN 16 282 Form 6 G ½″ with clamping sleeve DIN 16 283 G ½″	St 35.8-I 1.4571	**K 430 D** **K 480 D**

NPT adapter

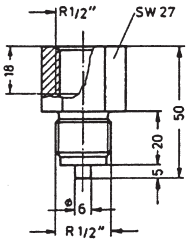


NPT adapter

The purpose of the NPT adapter is to connect pressure switches, pressure transmitters, pressure gauges, etc., to NPT threaded connections. A suitable sealing washer is also supplied.

Description	*Type*
NPT adapter, material 1.4104 and sealing ring DIN 16 258, Form C material ITC to DIN 3754 T.1	**NPT 1**

Pressure surge reducer



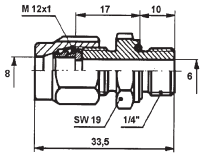
Pressure surge reducer

Material	*Type*
Ms	**DMW** (Water)

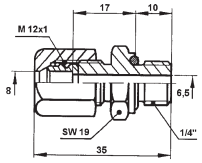
Type series MAU

Male adapter union for differential pressure switches and transmitters

all measures in mm



MAU 8 / Ms



MAU 8 / Nst

Male adapter union G ¼″ / 8 mm for adaption of:
- differential pressure switches DDCM
- pressure switches with ¼″ internal thread

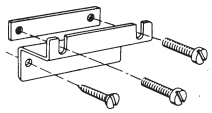
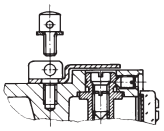
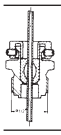
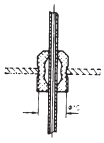
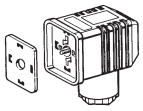
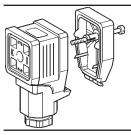
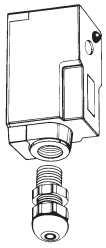
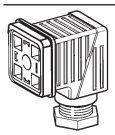
Type summary

	Body	*O-Ring*	*Type*
G ¼″-external thread with O-ring seal for connection of pipes with 8 mm outside diameter	Brass	NBR	**MAU 8/MS**
	Stainless steel (1.4571)	FPM	**MAU 8/Nst**

Maximum permissible temperature: 100 °C
Maximum permissible pressure: 100 bar
Consider maximum pressure of the pressure switches / pressure transmitters.

Accessories, spare parts

for thermostats and pressure switches

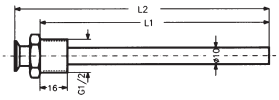
		Type
	**Wall bracket** including fixing screws and plugs (6 mm Ø) Included as standard with Type TRM thermostats. Suitable for all switching units.	**H 1**
	**Wall bracket** for fixing the sensor cartridges of capillary tube thermostats. Suitable for all Type TAM capillary tube thermostats.	**H 2**
	**Capillary tube holder** to attach the capillary tube of frost protection thermostats to the frame of the air heater (5 off packed in bag). Suitable for FT frost protection thermostats and frost protection FTS.	**H 3**
	**Sealing** consists of cover plate and screw for covering and sealing the adjustment screws. Only for switching device 200 (plug connection)	**P 2**
	Heating conducting compound to improve the transfer of heat, e. g. in the case of contact thermostats. Approx. 0.5 cm^3 in handy dispenser.	**WLP 1**
	**Capillary tube bushing** with 3 mm capillary tube (not pressure proof) screw in thread G ½″ suitable for all types TAM, FT and FTS.	**R 4**
	**Capillary tube bushing** Rubber plug for 3 mm capillary tube, bore diameter 10 mm. Not pressure proof (5 pieces in one bag). Suitable for series TA, FT and FTS.	**R 5**
	**Plug to DIN 43650** for switching units of series 200. with seal and fastening screw, 3-pole + earth contact.	**ST 5**
	**Plug to DIN 43650,** Can be opened for easy installation, 3-pole + earth contact, including sealings.	**ST 3**
	**Plug connectors with position indication** Operating voltage: 12–240 VAC/DC Operating current: max. 2 A LED current drain: max. 10 mA LED indication: green if voltage present at contact pin 1 red if voltage present at contact pin 2 Connection rotatable 270° engaging at increments of 45° Degree of protection: IP 65 Ambient temperature: 0–60 °C Suitable for pressure and temperature switches with plug connection (series 200) which are equipped with a microswitch (standard version).	**ST 218**
	**Plug,** can be opened (0–10 V). Suitable only for transmitters (low voltage), 3 pin. **Version for 4–20 mA**	**ST 7–3** **ST 7–2**

ST 7

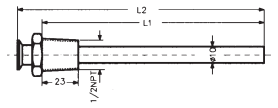
Type series ZT

Immersion tubes for thermostats and temperature transmitter

Immersion tubes G ½″

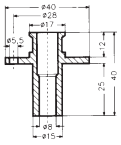


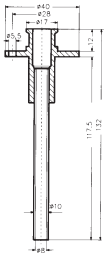
Immersion tubes ½″ NPT



Type	*Depth of immersion L_1 (mm)*	*Overall length L_2 (mm)*	*Suitable for*
Nickel-plated brass, G ½″			
R 1/Ms	135	151	**TAM …**
R 2/Ms	220	236	
R 3/Ms	500	516	
R 10/Ms	135	151	**TX…/TP**
R 20/Ms	220	236	
Stainless steel type (1.4571 + 1.4401) G ½″			
R 1/Nst	135	151	**TAM …**
R 2/Nst	220	236	
R 10/Nst	135	151	**TX…/TP**
R 20/Nst	220	236	
Nickel-plated brass type ½″ NPT			
RN 1/Ms	135	151	**TAM …**
RN 2/Ms	220	236	
RN 10/Ms	135	151	**TX…/TP**
RN 20/Ms	220	236	
Stainless steel type (1.4571 + 1.4401) ½″ NPT			
RN 1/Nst	135	151	**TAM …**
RN 2/Nst	220	236	
RN 10/Nst	135	151	
RN 20/Nst	220	236	

R 6 **R 7**

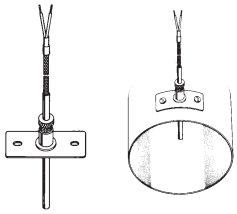




Immersion tubes with fixing flange for air ducts

Type	*Depth of immersion*	*Suitable for*
Material: steel, chromated		
R 6	135 mm	**TX …**
R 7	220 mm	
Mounting flange for Pt 100-/Pt 1000 sensor		
Sensor Ø = 5 mm		**R 8**

R 8 **(example for mounting)**



Using of the immersion tubes

	for pressure proof installation (up to 100 bar)					*for air ducts*		*for exhaust pipes*
	R 1 RN 1	**R 2 RN 2**	**R 3**	**R 10 RN 10**	**R 20 RN 20**	**R 6**	**R 7**	**R 8**
TAM…	■	■	■					
TX…				■		■		
TXB…					■		■	
Temperature Transmitter TP…				■ only together with retaining spring FF 135				■

Registration Number

Registration certificates VdTÜV, DVGW, DINCERTCO, PTB

TÜV DVGW

Copies of registration certificates are available on request

Type series	*Test Standard*	*Reg.-Number*	*Notified Body*
all DWR and Ex-DWR	VdTÜV Pressure 100/1	TÜV.DWFS (SDBFS).00-281	VdTÜV
DWR…205/305	VdTÜV Pressure 100/1	TÜV.SDB.97-310	VdTÜV
DWR…206/306	VdTÜV Pressure 100/1	TÜV.SDB.97-309	VdTÜV
DWR…	DIN 3398 / 3NG-4346AQ1411	DVGW	
DWR…	DIN 3398 T. 43C028/2000	DIN CERTCO	
DWAM…/DWAM-EX-i	VdTÜV Pressure 100/1	TÜV.DW.99-132	VdTÜV
DWAMV	VdTÜV Pressure 100/1	TÜV.DW.99-133	VdTÜV
SDBAM	VdTÜV Pressure 100/1	TÜV.DW.99-134	VdTÜV
DBUM	VdTÜV Pressure 100/1	TÜV.SDBF.99-136	VdTÜV
all DGM…	DIN 3398 / 3 + EN 1854	NG-4346AP1011	DVGW
all DGM…	DIN 3398 / and DVGW 90/396/EEC	CE-085AQ1088	DVGW
FD 16-326	DIN 3398 T. 4 Pressure 100/1	09-91-0109	TÜV
FD 16-327	DIN 3398 T. 4 Pressure 100/1	09-91-0110	TÜV
all Ex-Pressure switches	EEx de IIC T6	EX-90.C.1059	PTB
EX-011	EN 50014 and EN 50020	PTB 00 ATEX 2081	PTB
EX-041	EN 50014 and EN 50020	PTB 00 ATEX 2043	PTB

January 2002

Local Fema Partners in Europe, Middle East, Africa and Asia Pacific

Austria
Franz Schmachtl KG
Pummererstraße 36
4021 Linz
Phone: (43) 7 32 76 46-0
Fax: (43) 7 32 78 50 36

Belgium
ERIKS N. V.
Boombekelaan 3
2660 Hoboken
Phone: (32) 3-8 29 26 11
Fax: (32) 3-8 28 39 59

Bulgaria
Honeywell EOOD
14, Iskarsko Chaussee
POB 79
1592 Sofia
Phone: (359) 2 79 40 27
Fax: (359) 2 79 40 90

Czech. Republic
Honeywell spol s r. o.
Budejovicka 1
14021 Prague 4
Phone: (420) 2 61 12 27 77
Fax: (420) 2 61 12 26 91

Denmark
GRANZOW A/S
Ejby Industrievej 26
2600 Glostrup
Phone: (45) 43 20 26 00
Fax: (45) 43 20 26 99

Finland
Honeywell OY
Ruukintje 8
02320 Espoo 32
Phone: (358) 93 48 01 01
Fax: (358) 9 34 80 12 34

France
Bürkert & Contromatic France
B.P. 21
67220 Triembach au Val
Phone: (33) 3.88.58.91.11
Fax: (33) 3.88.57.20.08

Greece
Honeywell EPE
313 Irakliou Ave./1-3 Viotias Str.
Neon Iraklion – Athens
Phone: (30) 12 84 80 49
Fax: (30) 12 84 80 55

Hungary
Honeywell Kft.
Gogol u. 13
1133 Budapest
Phone: (36) 14 51 43 00
Fax: (36) 14 51 43 43

Italy
Honeywell S.p.A.
Via Gobetti, 2b
20063 Cernusco sul Naviglio
Phone: (39) 02 92 14 61
Fax: (39) 02 92 14 68 88

Netherlands
ERIKS B.V.
Postbus 280
1800 BK Alkmaar
Phone: (31) 72 5 14 15 14
Fax: (31) 72 5 15 56 45

Norway
Bürkert-Contromatic A/S
Box 243
2026 Skjetten
Phone: (47) 63-84 44 10
Fax: (47) 63-84 44 55

Poland
Honeywell sp. z.o.o.
ul. Domaniewska 41
(Budynek Mars)
02-672 Warsaw
Phone: (48) 2 26 06 09 00
Fax: (48) 2 26 06 09 01

Portugal
Honeywell Portugal Lda
Edificio Suecia II
Av do Forte Nr. 3 - Piso 3
2795 Carnaxide
Phone: (351) 2 14 24 50 00
Fax: (351) 2 14 24 50 99

Romania
Honeywell Romania S.R.L.
Blvd.Dacia No. 85
Ap.9, sector 2
70256 Bucharest
Phone: (40) 12 11 00 76
Fax: (40) 12 10 33 75

Russia
Honeywell Inc.
4th floor, Administrative Bldg.
of AO "Luzhniki" Management
Luzhniki 24
119048 Moscow
Phone: (7) 09 57 96 98 00/01
Fax: (7) 09 57 96 98 93/92

Slovak Republic
Honeywell Ltd
Mlynske Nivy 73
PO Box 75
82007 Bratislava 27
Phone: (421) 7 58 24 74 00/425
Fax: (421) 7 58 24 74 15

Spain
Honeywell S.A.
Josefa Valcárcel, 24
28027 Madrid
Phone: (34) 9 13 13 61 00
Fax: (34) 9 13 13 61 27

Sweden
Bürkert-Contromatic AB
Skeppsbron 13 B
21120 Malmoe
Phone: (46) 40 6 64 51 00
Fax: (46) 40 6 64 51 01

Switzerland
TRI-MATIC AG
Bösch 82
6331 Hünenberg
Phone: (41) 41 7 80 22 22
Fax: (41) 41 7 80 03 60

Turkey
Honeywell Otomasyon Ve Kontrol
Sistemleri San. Ve Tic. A.S.
Cayiryolu Sok. (Halyolu)
Ucgen Plaza No: 7, Kat 5-6-7
Icerenkoy 81120 / Istanbul
Phone: (90) 21 64 64 47 74
Fax: (90) 21 64 64 47 94

Ukraine
Honeywell
Zhelyabova 8/4
03680 Kiev
Phone: (38) 04 42 41 91 95
Fax: (38) 2 41 91 96

United Kingdom
Bürkert Contromatic Ltd.
Fluid Control Centre
Brimscombe Port, Bus. Park
Brimscombe Stroud,
Glos GL5 2QF
Phone: (44) 14 53 73 13 53
Fax: (44) 14 53 73 13 43

Middle East Headquarters
Honeywell Middle East Ltd.
Khalifa St.
Sheikh Faisal Building
Abu Dhabi, United Arab Emirates
Phone: (971) 26 27 25 33
Fax: (971) 26 26 95 39

Distributors & Africa Headquarters
Honeywell S.p.A.
International Operations
Via Gobetti, 2b
20063 Cernusco sul Naviglio
Phone: (39) 2 92 14 61
Fax: (39) 2 92 14 68 88

South Africa
WIKA INSTRUMENTS (Pty.) Ltd.
P.O. Box 75225
Gardenview 2047
Phone: (27) 11-621-0000
Fax: (27) 11-621-0049

Asia Pacific Headquarters
Honeywell Pte Ltd.
Honeywell Building
17 Changi Business Park Central 1
Singapore 486073
Republic of Singapore
Phone: (65) 35 50 28 28
Fax: (65) 4 45 30 33

Honeywell

FEMA

Fema Controls
Honeywell AG
Böblinger Strasse 17
D-71 101 Schönaich
Phone (49) 70 31 6 37-02
Fax (49) 70 31 6 37-8 50
E-Mail fema@honeywell.com
http://www.honeywell.de/fema

CE

LonMark®

EN3B-0266GE51 R0202