DATASHEET 326 - LOADING COMPUTER

LOADING COMPUTER

WITH ANALOG VALVE CONTROL FOR SMOOTH RAMP-UP / RAMP DOWN

Features

- Displays: quantity loaded, preset value, flow rate, product name.
- Smooth ramp-up and multi-stage ramp-down control.
- Extensive monitoring functions ensures maximum safety.
- Compact, explosion-proof enclosure.
- Rugged keyboard with 18 metal keys.
- Very large and clear 80 character alpha-numeric display.
- Inputs for: pulse and namur sensors.
- Fail safe inputs to control the process remotely.
- Batch, time and alarm relays available.
- Very high accuracy thanks to a self learning process control.
- Operational temperature -20°C (-4°F) up to +60°C (+140°F).
- User-friendly operation with clear menu structure.
- Four styles of housing are available. Wall-mount housing comes as standard.
- Flameproof enclosure ATEX: Ⓔx II 2 G EEx d IIB T5.

Control and alarm output

- 4 - 20mA output; 10 bit signal to drive a control valve for accurate ramp-up and ramp-down control.
- Three, volt-free electro-mechanical relays with make and break contacts or solid state relays.

Signal input

Flow

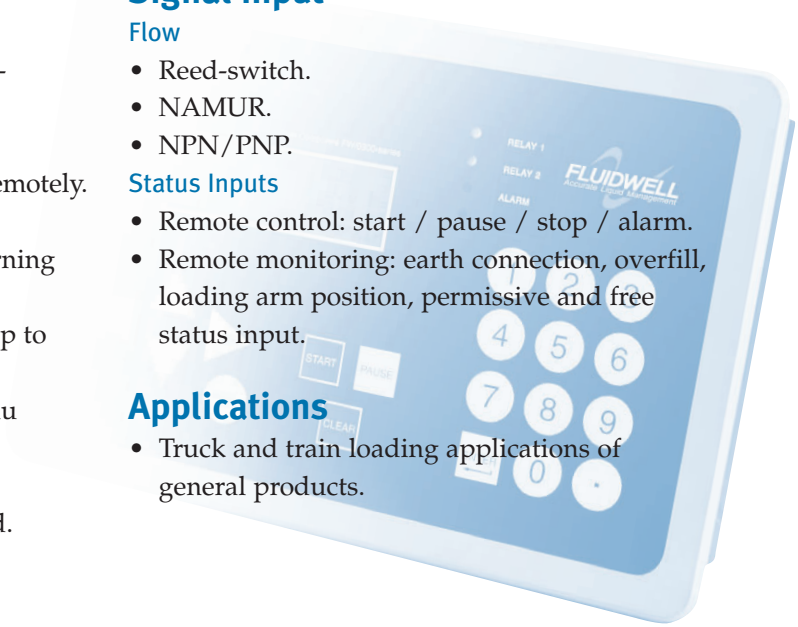
- Reed-switch.
- NAMUR.
- NPN/PNP.

Status Inputs

- Remote control: start / pause / stop / alarm.
- Remote monitoring: earth connection, overfill, loading arm position, permissive and free status input.

Applications

- Truck and train loading applications of general products.



General information

Introduction

The Loading Computer Model 326 is a preset especially designed for the automation of loading terminals in Hazardous areas. It is a "stand-alone" preset system with full communication options to link with high-end computer systems. The analog actuator control output is used to precisely regulate valve closure during an eight stage ramp-down cycle. With the mechanical relay outputs, pumps and non-drip valves can be controlled or used for two-stage process control of the valve.

Screen display

An alphanumerical LCD display of 4 lines x 20 positions is integrated in the control panel. During the process several parameters are shown at the same time; the process can be checked at a single glance. The clear display text is available in three languages.

Batch size

The preset value to be batched can be programmed directly by the operator.
A maximum and minimum batch-size can be set in the configuration menu. As soon as the operator enters an unallowed quantity, a message is given while the value is not excepted.

Ramp-up / ramp-down

The batch-process is started-up gradually by spreading the increasing analog-signal over a time span. During ramp-down, the valve is closed step by step. Based on the remaining quantity to be batched, a total of nine steps are to be set. In this way, the liquid is managed precisely and without shocks, also if small quantities are batched. A special function realises even under emergency circumstances a well managed shutt-down.

Retained data

The total quantity of batched liquid and the number of batches are recorded.

Password protection

All settings, values and actions can be protected with a password selected by the customer.

Relays

Three relays are available for the controlling of devices like two-stage valves, no-drip valve, pump control and alarm output. The relays are process and time controlled.

Process monitoring

The batch controller allows various monitor functions to be set to specific values, depending on the application. If a certain value is exceeded, the system triggers an alarm status. The process is interrupted and the latest process values are stored in the memory. At the same time, the cause of the alarm is displayed. Alarm conditions are indicated audibly, visibly and by means of an alarm relay. The monitor functions includes flow rate, earth connection, loading arm position, overfill, overrun and permissive.

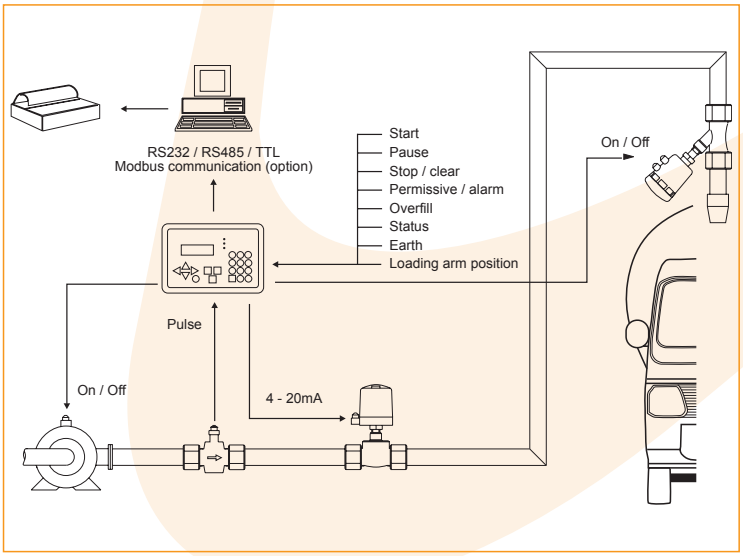
Power failure

Under power failure conditions the actual process information is stored in the memory. This allows the process to be resumed where it was interrupted.

Communication

A serial interface (option) allows full computer control of the 326. All process data and settings can be read / modified through the communication link as well as a batch can be started / stopped. Additionally, the keyboard and display can be fully controlled as an input terminal for e.g. driver I.D. and order entry.

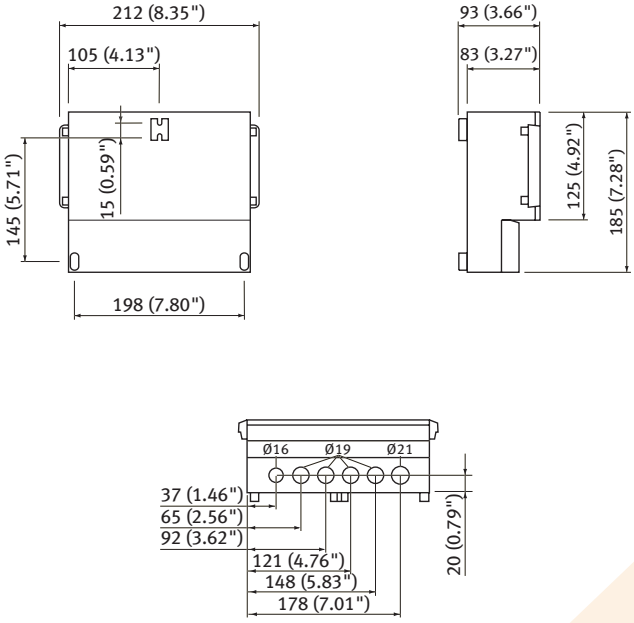
Overview application 326



Dimensions enclosures

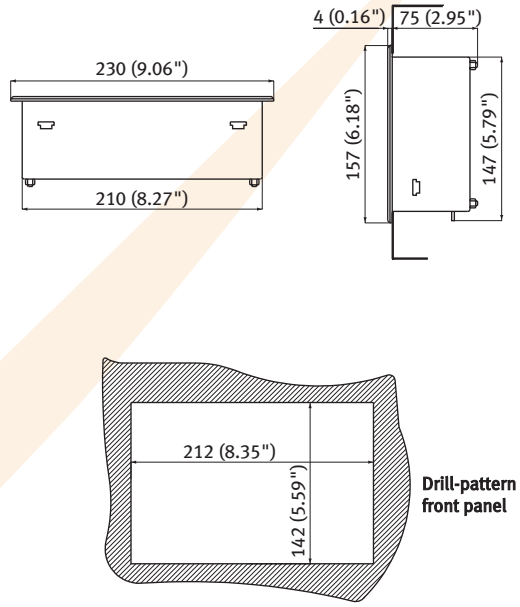
Enclosure HK (STANDARD)
Polystyrol wall mount casing IP50

dimensions: mm (inch)



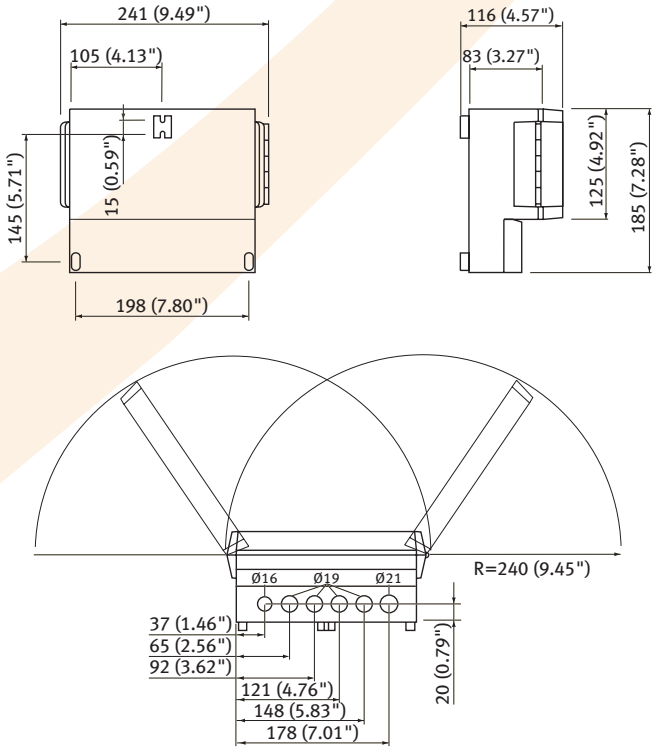
Enclosure HM
Panel-mount casing IP65

dimensions: mm (inch)



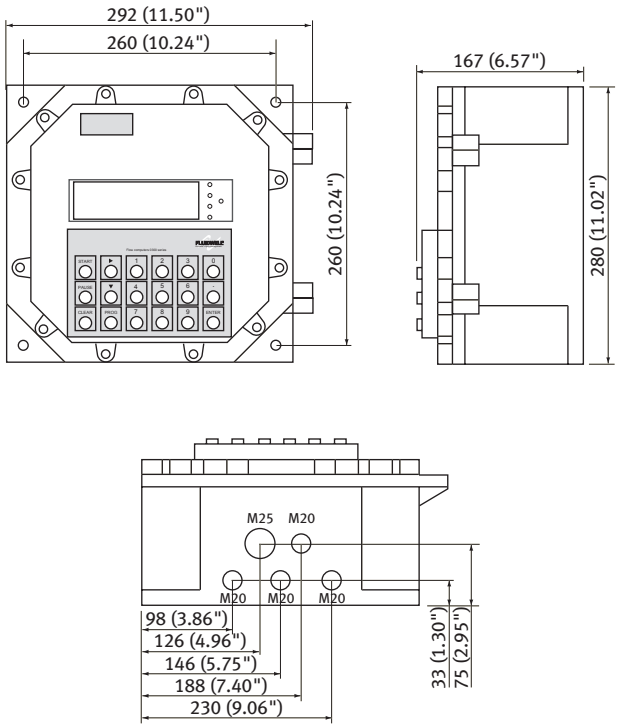
Enclosure HL
Polystyrol wall mount casing IP65 (frontdoor)

dimensions: mm (inch)

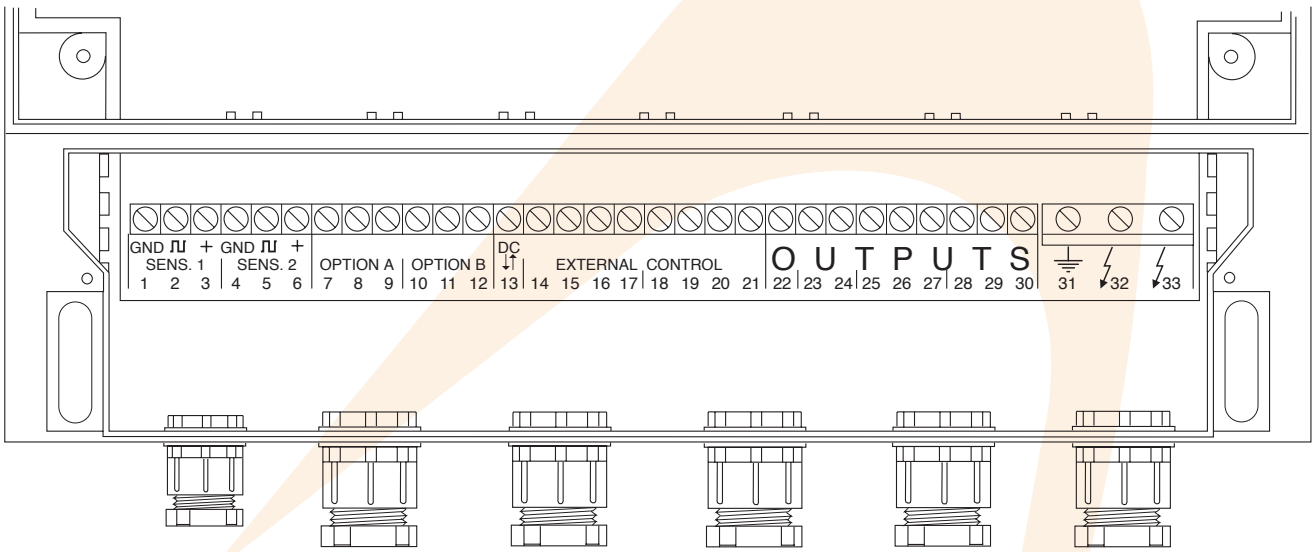


Enclosure HX
Compact explosion proof EExd casing

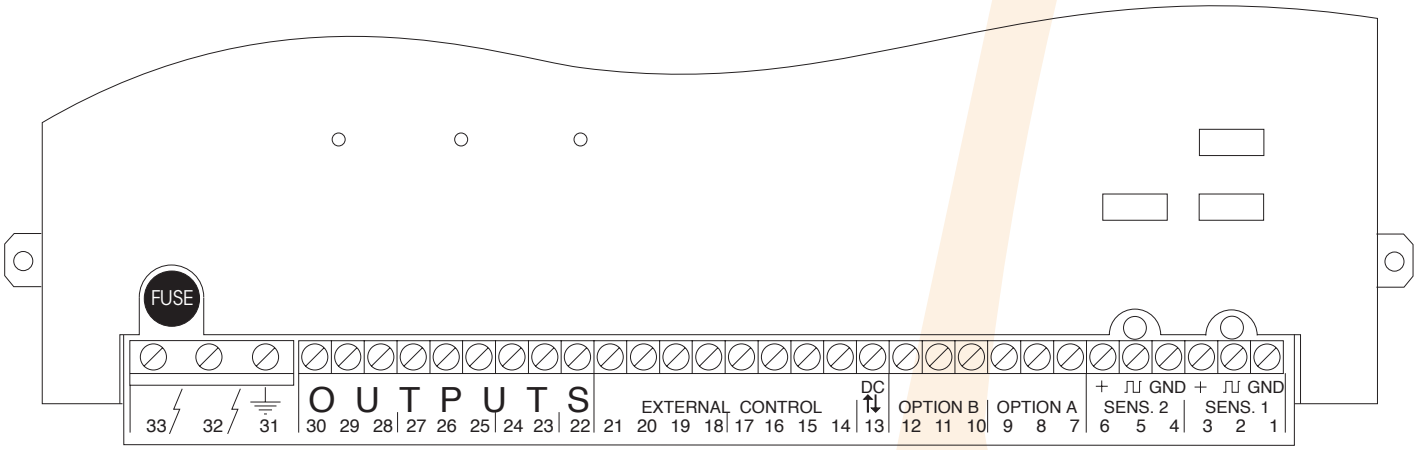
dimensions: mm (inch)



Terminal connections wall mount enclosures types: HK - HL - HX



Terminal connections Panel mount enclosure type: HM



Explanation terminal connections

Terminal	Function	Explanation
01	sensor GND	Ground and shielding terminal.
02	sensor pulse	NPN or PNP pulse selected with a switch. Namur input has to be orderd.
03	sensor 12 / 24V DC	Votage selected with a switch. Namur sensor type supplies 8.2V DC.
04	not used	Pulse supression: by connecting terminal 5 with 6 the flow meter signal (terminal 2)
05	HOLD	will be ignored, the monitor functions are disabled and the LED will not light up.
06	HOLD 8.2/12/24V DC	
07	not used	
08	not used	Current sink: do connect a 8 - 24V DC power supply (terminal 6 or external) to the
09	analog output	plus (+) of the device and the minus (-) to terminal 9. Minimum load 100 Ohm.
10	RS485: GND	Communication option.
11	RS485: RXD/a	Modbus ASCII / RTU. Maximum comm. speed 9600 baud.
12	RS485: TXD/b	Cable length RS485 max. 1200 meters.
13	external GND	By shortly connecting terminal 14, 15, 16 or 17 with connector 13 (GND), the functions
14	external START	START, PAUSE and CLEAR can be operated by remote control,
15	external PAUSE	or an alarm can be triggered. Minimum impulse duration 200 ms.
16	external CLEAR	
17	external alarm	Normally activated (fail safe). Permissive input.
18	overfill alarm	Normally activated (fail safe).
19	status	Normally activated (fail safe). Status can be read through communication.
20	earth switch	Normally activated (fail safe).
21	positioner	Normally activated (fail safe).
22	alarm relay NO	Mech. relay: potential free make-and-break contact; max. switch power 1A - 230V AC.
23	alarm relay C	excited in normal condition(C and NO are connected); fail-safe.
24	alarm relay NC	
25	relay 1 NO / s.s. +	Mech. relay: potential free make-and-break contact; max. switch power 1A - 230V AC.
26	relay 1 C / s.s. -	Solid state relay: passive DC output; max. switch power 1A - 50V DC.
27	relay 1 NC / not used	Function depends on configuration.
28	relay 2 NO / s.s. +	Mech. relay: potential free make-and-break contact; max. switch power 1A -230V AC.
29	relay 2 C / s.s. -	Solid state relay: passive DC output; max. switch power 1A - 50V DC.
30	relay 2 NC / not used	Function depends on configuration.
31	power supply	Earthing.
32	power supply	230V AC or 24V AC / DC or 12V AC / DC.
33	power supply	230V AC or 24V AC / DC or 12V AC / DC.

Technical specification

General

Display	
Type	Bright transflective alpha-numeric LCD with LED backlight.
Digits	4 lines (20 characters per line). Standard 5mm (0.2") digits; EExd enclosure 9mm (0.35") digits.
Refresh rate	Ten times a second.
Languages	English, German, French, Dutch.

Casing	
Type HK	Wall-mount IP50. Dimensions 212 x 185 x 93 mm (8.35" x 7.28" x 3.66") - LxWxH.
Type HL	Wall-mount with front-door IP65. Dimensions 241 x 185 x 116mm (9.49" x 7.28" x 4.57") - LxWxH.
Type HM	Panel-mount IP65. Aluminium/stainless steel enclosure. Dimensions 230 x 157 x 79 mm (9.06" x 6.18" x 3.11") - LxWxH. Panel cut-out: 212 x 142 mm (8.35" x 5.59") LxH.
Type HX	EExd enclosure IP54 – Die-cast aluminium. Cable entries: 1 x M25 – 4 x M20. Dimensions 292 x 280 x 167 mm (11.50" x 11.02" x 6.57")-LxWxH.
Control keys	Twenty industrial micro-switch keys with tactile feedback and embossed design. UV-resistant polyester keypad. EExd version: eighteen rugged metal keys.

Operating temperature	
Operational	-10°C to +55°C (14°F to +131°F).

Power requirements	
Type PP	12V AC/DC - 15VA.
Type PR / PS	22 - 28V AC/DC - 15VA.
Type PT / PU	105 - 130V AC / 50Hz - 15VA.
Type PV / PW	210 - 240V AC / 50Hz - 15VA.

Sensor excitation	
Standard	Stabilized 12V DC or 24V DC - selection with switch or 8.2 V DC when Namur input specified. Max. 100mA @ 24V DC.

Data protection	
Type	NVRAM backup of all settings including process data figures prior to any sudden or unexpected power failures. Data retention 10 years.

Hazardous area (optional)	
Explosion proof	Atex approved according to Ex II 2 G EEx d IIB T5. With 18 robust micro-switch keys. Compact case design.
Type XM	Operational temperature -20°C to +60°C (-4°F to +140°F). Includes automatic temperature compensated LCD contrast adjustment.

Environment	
CE	EMC compliant ref: EN50081 and EN50082.

Signal inputs

Pulse inputs	
Type P	NPN/PNP, open collector.
Type N	Namur type sensors.
Type S	Reed-switch.
Frequency	Minimum 0 Hz - maximum 10 KHz (18KHz) for total and flow rate.
K-factor	0.0001 - 9,999 with variable decimal position.

Logic inputs	
Function	Functionality and parity function dependent. Start / Pause / Clear / Permissive / Earth / Position loading arm / overfill / Status.
Type	Eight status inputs.
Voltage	8 - 24V DC supplied - external voltage max. 24V DC.
Duration	Minimum pulse duration 200msec.

Signal outputs

Analog output (optional)	
Function	Control a proportional valve.
Type AC	Isolated current-sink output 4 - 20mA. Power supply available.
Accuracy	10-bit error < 0.05%. Software function to calibrate the 4.00mA and 20.00mA levels precisely.

Relay outputs	
Function	time relay, no drip valve or two stage / pump control.
Type PP/PR/ PT/PV	Three mechanical relays with volt-free make and break contacts.
Maximum load	1A - 230V AC/DC - Two relays protected with RC.
Type PS/PU/PW	Solid-state relays: max. load 1A - 50V DC.

Communication option (optional)	
Function	All process data and settings can be read / modified through the communication link as well as a batch can be started / stopped. Additionally, the keyboard and display can be fully controlled as an input terminal for e.g. driver I.D. and order entry.
Type CH	RS485 (2-wire).
Protocol	Modbus ASCII / RTU.
Speed	1200 - 2400 - 4800 - 9600 baud.
Addressing	Maximum 255 addresses.

Operational

Operator functions	
Displayed functions	• Preset value. • Actual loaded quantity. • Flow rate. • Productname. • %-bargraph during loading.

Preset value / loaded quantity / total	
Digits	7.
Units	mL, hL, L, m^3, cc, gl, bb, gr, kg, Tn, pt, p, _.
Decimals	0 - 6.

Flow rate	
Units	mL, hL, L, m^3, cc, gl, bb, gr, kg, Tn, pt, p, _.
Time	Minute / second.

Enclosure HK (STANDARD)
Polystyrol wall mount casing IP50

Enclosure HM
Panel-mount casing IP65

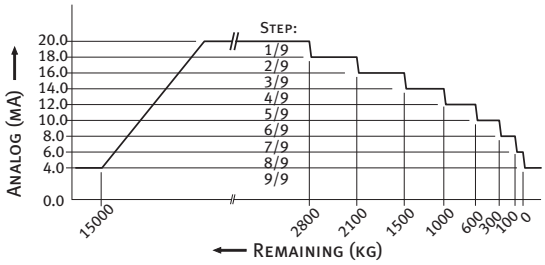
Enclosure HL
Polystyrol wall mount casing IP65 (frontdoor)

Enclosure HX
Compact explosion proof EExd casing IP54

Display example

```
1A          DIESEL
ACTUAL     3450.58 L
PRESET     8500.00 L
FLOWR.   548.45 L/min
```

Example course of processing a large batch



Ordering information

Example (standard configuration)

326-P-AX-CX-HK-PV-XX-ZX.

Explanation standard configuration:

P: input signal: NPN/PNP; **AX**: no analog output; **CX**: no communication; **HK**: polystyrol wall mount casing IP50; **PV**: 230V AC + mechanical relays; **XX**: Safe area; **ZX**: no options.

Ordering information:	326	-_	-A _	-C _	-H _	-P _	-X _	-Z _
Input signal								
N	Namur.							
P	**NPN / PNP.**							
S	Reed switch input.							
Analog output signal								
AC	Isolated 4 - 20mA output for control valve, current sink.							
AX	**No analog output signal.**							
Communication								
CH	Communication RS485 - 2-wire - Modbus ASCII / RTU.							
CX	**No communication.**							
Enclosure								
HK	**Polystyrol wall mount casing IP50.**							
HL	Polystyrol wall mount casing IP65 (frontdoor).							
HM	Panel-mount casing IP65.							
HX	Explosion proof casing IP54 (type XM).							
Power supply and relays								
PP	12V AC / DC + mechanical relays.							
PR	24V AC / DC + mechanical relays.							
PS	24V AC / DC + solid state relays.							
PT	115V AC + mechanical relays.							
PU	115V AC + solid state relays.							
PV	**230V AC + mechanical relays.**							
PW	230V AC + solid state relays.							
Hazardous area								
XM	⟨Ex⟩ II 2 G EEx d IIB T5; 18 keys; -20°C / +60°C; 3 x M20 - 1 x M25.							
XX	**Safe area only.**							
Other options / Specials								
ZN	Remove RC-filter mechanical relays.							
ZX	**No options.**							

The bold marked text contains the standard configuration.

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