



Filter Clogging Indicators

1. TECHNICAL SPECIFICATIONS

1.1 GENERAL

HYDAC clogging indicators are designed to show visually and/or electrically when a filter element must be changed or cleaned. Operational safety of a system and efficient utilisation of a filter element can only be guaranteed if clogging indicators are used.

Depending on the type of filter, vacuum, return line or differential pressure clogging indicators are used.

1.2 SEALS

NBR (= Perbunan) or V (= Viton)

1.3 INSTALLATION

Some users install filters without clogging indicators and prefer instead to replace or clean the elements according to a specified time schedule or according to a set number of operating hours. However this involves some risk.

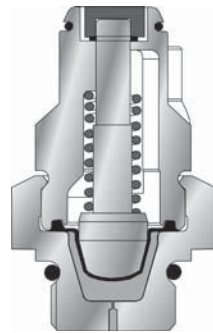
Fitting a clogging indicator has two main advantages:

- The operator no longer has to estimate when the element is clogged
 - The unnecessary costs of changing the element too early are avoided
- All standard filters can be fitted with a clogging indicator at any time, by simply screwing it in.

1.4 CONSTRUCTION

Return line indicators

These are used for return line and suction filters. In return line filters they react to the increasing static pressure before the filter element, caused by increasing contamination; in suction filters to the decreasing pressure after the filter element.

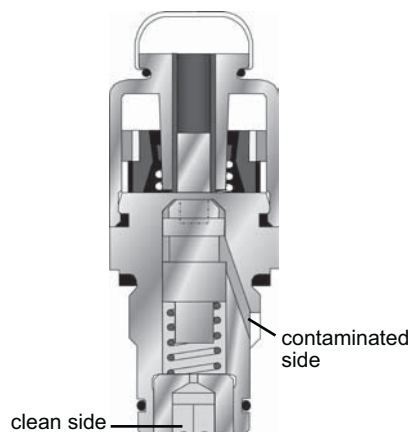


Differential pressure indicators

These are used for all inline filters and react to the increasing pressure differential caused by increasing contamination of the filter element.

Simple mounting of the differential clogging indicator: G 1/2" cavity (according to HYDAC works standard HN 28-22)

The differential pressure indicator, type V02, must be fitted separately inline.



1.5 SPECIAL INDICATORS

Mobile indicators

These indicators have been developed for special applications and are fitted with AMP, Deutsch and Junior Power Timer plugs.

ATEX indicators

These indicators are used in potentially explosive locations and are subject to the ATEX Equipment Directive 94/9/EC and the ATEX Operator Directive 1999/92/EC.



UL indicators

Indicators which are exported to the USA often require classification according to the UL standards in force. The UL symbol is found on many products, particularly in the field of electrotechnology.



1.6 TABLE OF CONTENTS

Contents	Page
Quick selection table by indicator type	50
Quick selection table by filter type	51
Standard indicators	
Vacuum	52
Return line	55
Differential pressure	69
Indicator for Condition Monitoring	72
Mobile indicators	
Return line	77
Differential pressure	77
ATEX indicators	
Return line	79
Differential pressure	80
UL indicators	
Differential pressure	82
Model code standard	84
Adaptors	86
DESINA specification	88

2. QUICK SELECTION TABLES FOR CLOGGING INDICATORS

2.1 BY INDICATOR TYPE

Please select the type of indicator you require from the table.

Type		Vacuum indicator	Return line indicator	Differential pressure indicator
Visual	B		●	●
	BM			●
	E		●	
	ES		●	
	K	●		
	R		●	
	UBM	●		
	UE	●		
	V			●
Electrical	C		●	●
	D		●	●
	F		●	
	LE		●	●
	LZ		●	●
	UF	●		
	VE			●
	VZ			●
Electronic	GC		●	●
	GW			●
Mobile	CD		●	●
	CJ		●	●
	FD		●	
ATEX	B		●	●
	C		●	●
UL approval (=CRUUS)	C			●
	D			●

2.2 BY FILTER TYPE

Please select the type of indicator required for your filter from the table.

Type	BF	BL	BLT	DF DFF	DFDK	DF MA/QE	DFM	DFN	DFP	DFZ	ELF	FLN	FLND FMND	HFM	LF	LFM	LFN LFNF
B				•	•	•	•	•				•	•	•	•	•	•
BM				•	•	•	•	•	•	•		•	•	•	•	•	•
E																	
ES																	
K	•	•	•								•						
R																	
UBM	•	•	•								•						
UE												• ²⁾			• ²⁾		
V																	
C				•	•	•	•	•	•	•		•	•	•	•	•	•
D				•	•	•	•	•	•	•		•	•	•	•	•	•
F																	
LE				•	•	•	•	•	•	•		•	•	•	•	•	•
LZ				•	•	•	•	•	•	•		•	•	•	•	•	•
UF												• ²⁾			• ²⁾		
VE																	
VZ																	
GC				•	•	•	•	•	•	•		•	•	•	•	•	•
GW																	
CD				•	•	•	•	•	•	•		•	•	•	•	•	•
CJ				•	•	•	•	•	•	•		•	•	•	•	•	•
FD																	

Type	LPF	MDF	MF	MFD	MFM	NF	NFD	RF	RFD	RFL	RFLD	RFN	RFND	RFM	RKM	SF	SFF	SFM
B	•	•			•	• ¹⁾	• ¹⁾	•	•	•	•	•	•	•	•			
BM	•	•			•	•	•			•	•							
E			• ³⁾	• ³⁾		• ¹⁾	• ¹⁾	•	•			•	•	•				
ES						• ¹⁾	• ¹⁾	•	•			•	•	•				
K																		
R															•			
UBM																		
UE	• ²⁾		• ²⁾	• ²⁾						• ²⁾					•	•	•	•
V										•	•							
C	•	•			•	•	•	•	•	•	•	•	•	•	•			
D	•	•			•	•	•	•	•	•	•	•	•	•	•			
F			•	•		• ¹⁾	• ¹⁾	•	•			•	•	•	•			
LE	•	•			•	•	•	•	•	•	•	•	•	•	•			
LZ	•	•			•	•	•	•	•	•	•	•	•	•	•			
UF	• ²⁾		• ²⁾	• ²⁾						• ²⁾					•	•	•	•
VE										•	•							
VZ										•	•							
GC	•	•			•	•	•	•	•	•	•	•	•	•	•			
GW	•					•	•			•	•							
CD	•	•			•	•	•	•	•	•	•	•	•	•	•			
CJ	•	•			•	•	•	•	•	•	•	•	•	•	•			
FD			•	•		• ¹⁾	• ¹⁾	•	•			•	•	•	•			

¹⁾ Filter type NF: Version 1.X only
(= tank mounted)


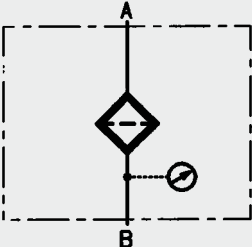
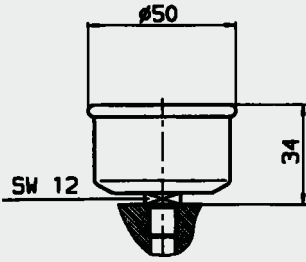

²⁾ can only be used for suction operation

³⁾ use VMF 16 E.0 only


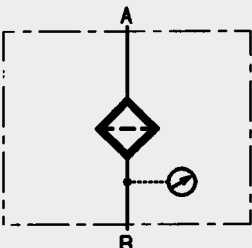
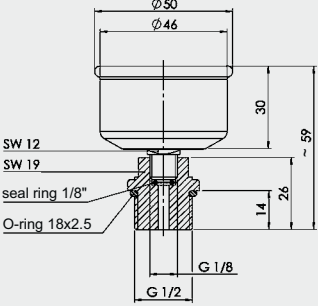

3. SPECIFICATIONS

3.1 VACUUM INDICATORS


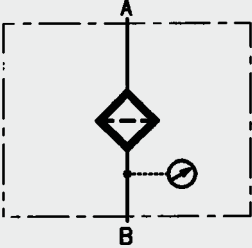
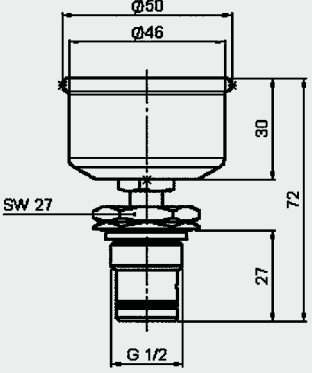

VMF x UE.x

 	Type of indication	visual-analogue, scale indication	 
	Weight	100 g	
	Pressure setting / indication range	-1 bar to 0 bar	
	Permiss. operating pressure	-0.7 to 0 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VMF 1 UE.0		


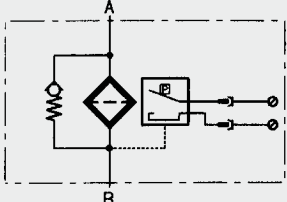
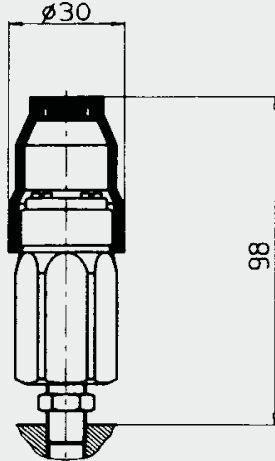
VR x UE.x

 	Type of indication	visual analogue, scale indication	 
	Weight	100 g	
	Pressure setting / indication range	-1 bar to 0 bar	
	Permiss. operating pressure	-0.7 to 0 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/2	
	Max. torque	30 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VR 1 UE.0		


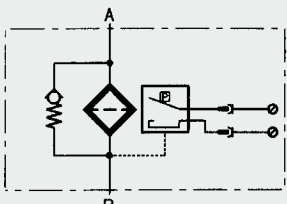
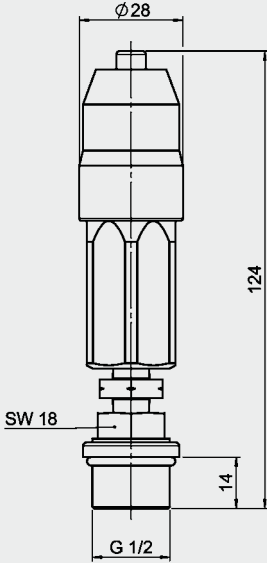
VRD x UE.x

 	Type of indication	visual analogue, scale indication	 
	Weight	100 g	
	Pressure setting / indication range	-1 bar to 0 bar	
	Permiss. operating pressure	-0.7 to 0 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/2	
	Max. torque	33 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VRD 1 UE.0		


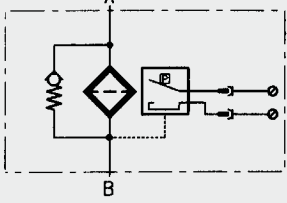
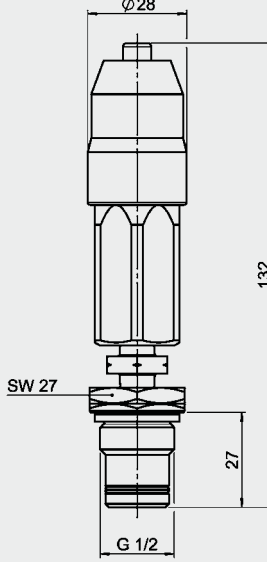
VMF x UF.x

 	Type of indication	electrical switch	
	Weight	170 g	
	Pressure setting / indication range	-0.2 bar ± 0.1 bar	
	Permiss. operating pressure	20 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/O contact	
	Max. switching voltage	42 V	
	Electrical connection	threaded connection	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 2.5 A at 24 V = ohmic 2.5 A at 42 V ~	
	Protection class to DIN 40050	IP 65, terminals IP 00	
Order example	VMF 0.2 UF.0		


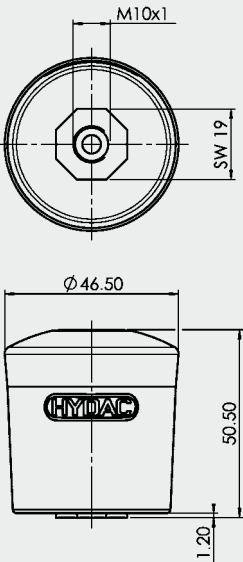
VR x UF.x

 	Type of indication	electrical switch	
	Weight	170 g	
	Pressure setting / indication range	-0.2 bar ± 0.1 bar	
	Permiss. operating pressure	20 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	30 Nm	
	Switching type	N/O contact	
	Max. switching voltage	42 V	
	Electrical connection	threaded connection	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 2.5 A at 24 V = ohmic 2.5 A at 42 V ~	
	Protection class to DIN 40050	IP 65, terminals IP 00	
Order example	VR 0.2 UF.0		

VRD x UF.x

 	Type of indication	electrical switch	
	Weight	170 g	
	Pressure setting / indication range	-0.2 bar ± 0.1 bar	
	Permiss. operating pressure	20 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	33 Nm	
	Switching type	N/O contact	
	Max. switching voltage	42 V	
	Electrical connection	threaded connection	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 2.5 A at 24 V = ohmic 2.5 A at 42 V ~	
	Protection class to DIN 40050	IP 65, terminals IP 00	
Order example	VRD 0.2 UF.0		

VMF x UBM.x

	Type of indication	visual, yellow pin	
	Weight	0.05 g	
	Pressure setting / indication range	-0.035 bar	
	Permiss. operating pressure	1 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	M10 x 1	
	Max. torque	15 Nm	
	Switching type	-	
	Max. switching voltage	-	
	Electrical connection	-	
	Max. switching output at resistive load	-	
	Switching capacity	-	
	Protection class to DIN 40050	-	
	Order example	VMF 0.035 UBM.0	

3.2 RETURN LINE INDICATORS

VMF x B.x

	Type of indication	visual, red pin	
	Weight	84 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VMF 2 B.1	

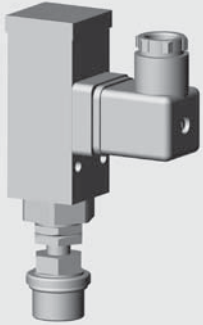
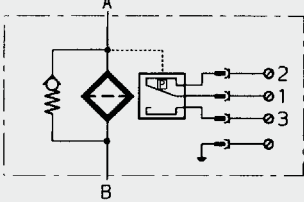
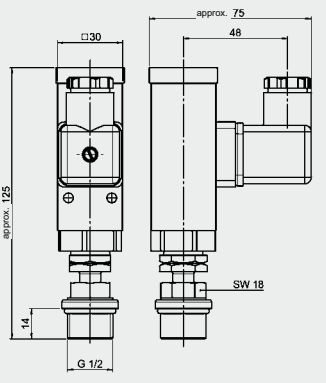
VR x B.x

	Type of indication	visual, red pin	
	Weight	44 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	15 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VR 2 B.1	

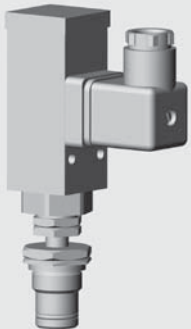
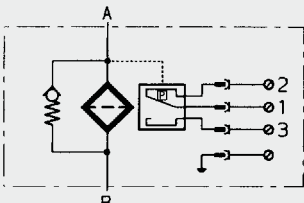
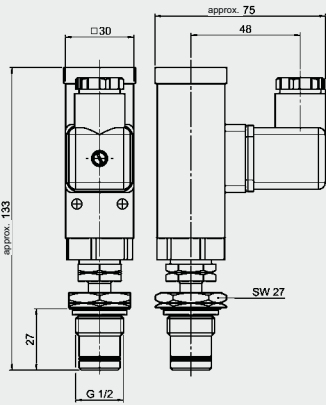
VMF x C.x

	Type of indication	electrical switch	
	Weight	270 g	
	Pressure setting / indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection, PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V = ohmic 0.03 to 6 A to max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VMF 2 C.0	


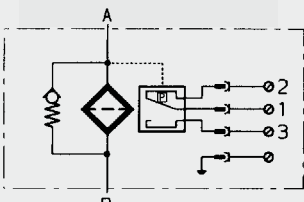
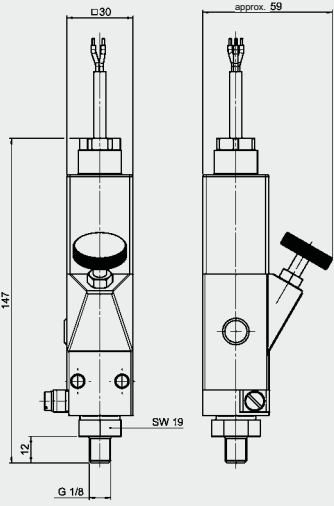
VR x C.x

 	Type of indication	electrical switch	
	Weight	340 g	
	Pressure setting / indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	30 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection, PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V ohmic 0.03 to 6 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VR 2 C.0		


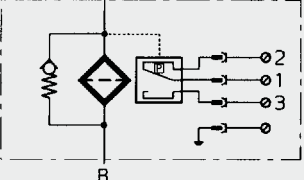
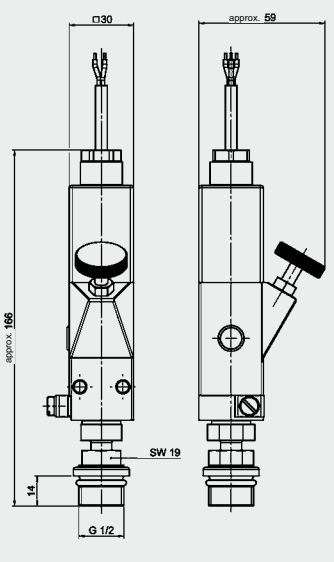
VRD x C.x

 	Type of indication	electrical switch	
	Weight	340 g	
	Pressure setting / indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	33 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection, PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V ohmic 0.03 to 6 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VRD 2 C.0		

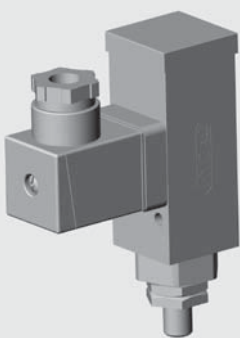
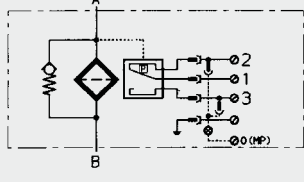
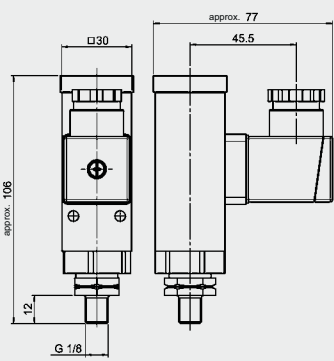
VMF x C.x /-Ex

 	Type of indication	electrical switch	
	Weight	270 g	
	Pressure setting / indication range	2 bar ± 0.3 bar	
	Permiss. operating pressure	200 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	250 V	
	Electrical connection	cable connection PG 9 cable length 2 m	
	Max. switching output at resistive load	62.5 W = 250 VA ~	
	Switching capacity	ohmic 0.25 A at 250 V = ohmic 1 A at 250 V ~	
	Protection class to DIN 40050	EX II 2G EEx d II C T6 / T5	
Order example	VMF 2 C.0 /-Ex		

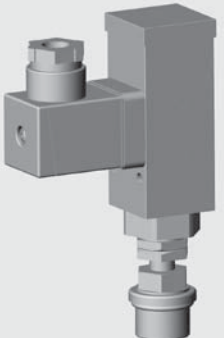
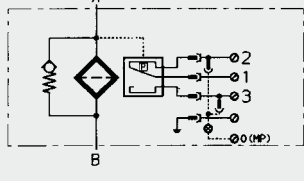
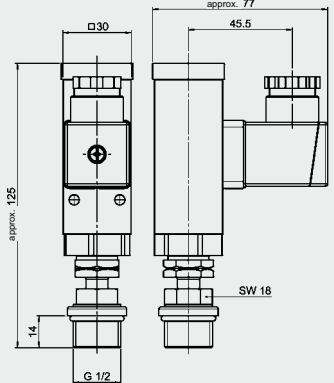
VR x C.x /-Ex

 	Type of indication	electrical switch	
	Weight	340 g	
	Pressure setting / indication range	2 bar ± 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	30 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection, PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A to 24 V ohmic 0.03 to 6 A to max. 230 V ~	
	Protection class to DIN 40050	EX II 2G EEx d II C T6 / T5	
Order example	VR 2 C.0 /-Ex		

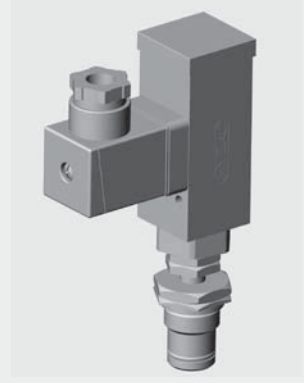
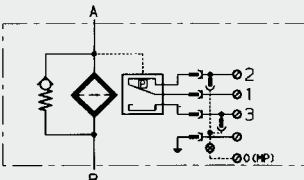
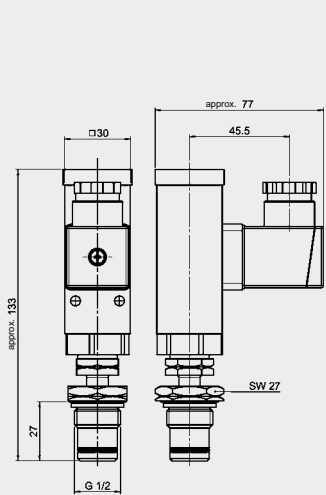
VMF x D.x /-L...

 	Type of indication	visual indicator and electrical switch	
	Weight	300 g	
	Pressure setting / indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	24, 48, 110, 230 V (depending on the type of light insert)	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 230 V = ohmic 0.03 to 6 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VMF 2 D.0 /-L24		

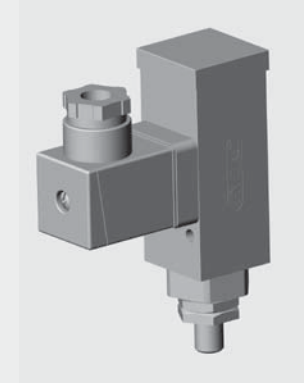
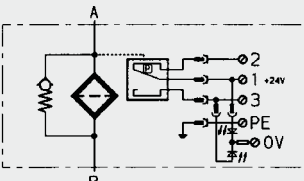
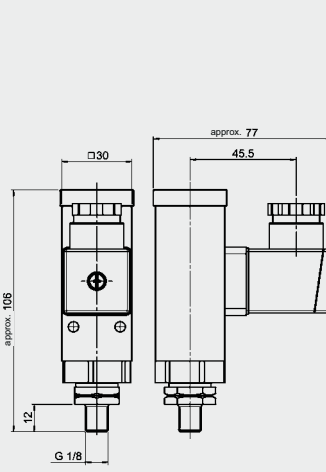
VR x D.x /-L...

 	Type of indication	visual indicator and electrical switch	
	Weight	360 g	
	Pressure setting / indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	30 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	24, 48, 110, 230 V (depending on the type of light insert)	
	Electrical connection	plug connection, PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V = ohmic 0.03 to 6 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VR 2 D.0 /-L110		

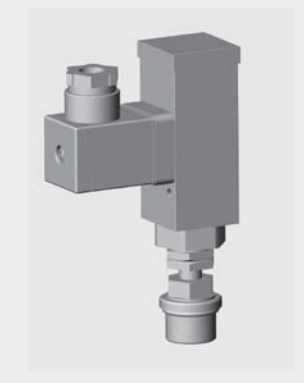
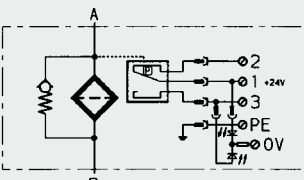
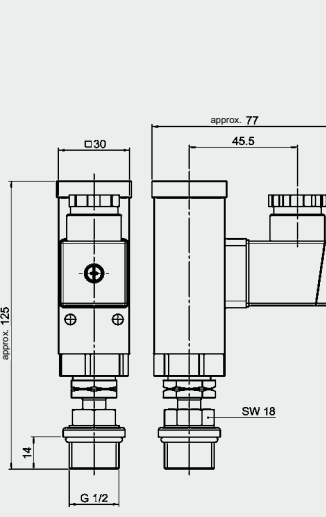
VRD x D.x /-L...

 	Type of indication	visual/electrical, electrical switch	
	Weight	360 g	
	Pressure setting / indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	33 Nm	
	Switching type	N/C or N/O, (change-over contacts)	
	Max. switching voltage	24, 48, 110, 230 V (depending on the type of light insert)	
	Electrical connection	plug connection, PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V = ohmic 0.03 to 6 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VRD 2 D.0 /-L110	

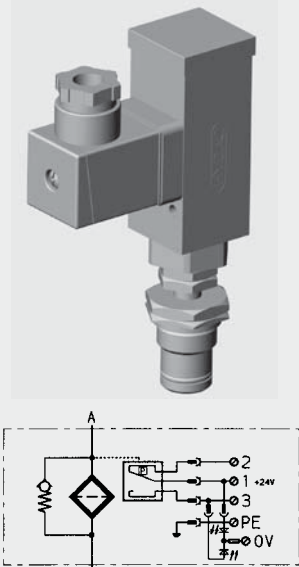
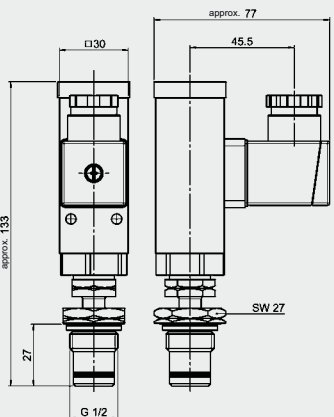
VMF x D.x /-LED

 	Type of indication	visual/electrical, electrical switch	
	Weight	300 g	
	Pressure setting/indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/O contact	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VMF 2 D.0 /-LED	

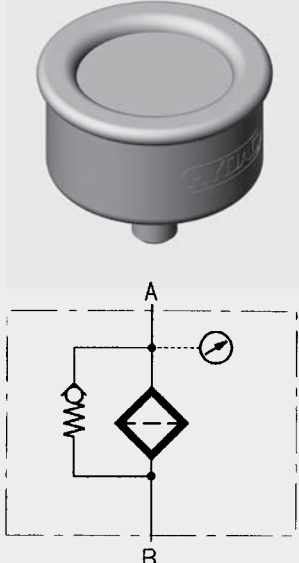
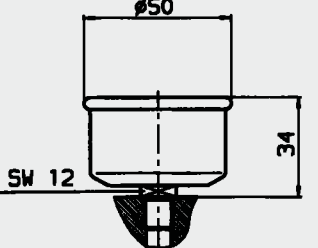

VR x D.x /-LED

 	Type of indication	visual/electrical, electrical switch	
	Weight	360 g	
	Pressure setting/indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	30 Nm	
	Switching type	N/O contact	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VR 2 D.0 /-LED	

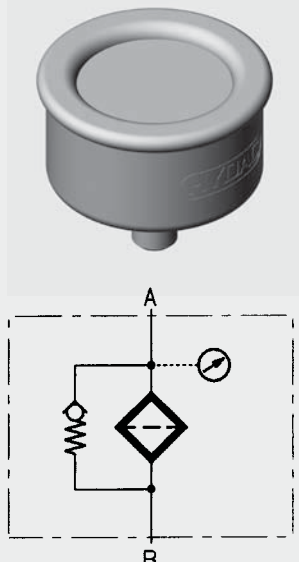
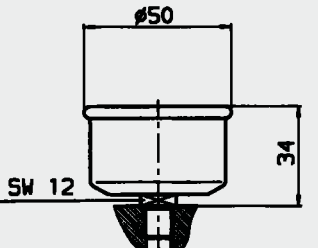

VRD x D.x /-LED

	Type of indication	visual/electrical, electrical switch	
	Weight	360 g	
	Pressure setting / indication range	2 bar - 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	33 Nm	
	Switching type	N/O contact	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A at 24 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VRD 2 D.0 /-LED		


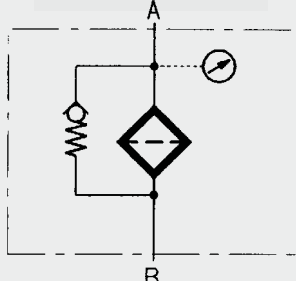
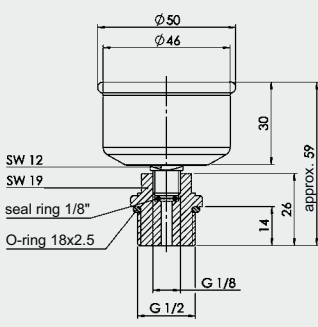

VMF x E.x

	Type of indication	visual/analogue, scale indication	 
	Weight	80 g	
	Pressure setting / indication range	0 bar to +10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	-	
	Max. switching voltage	-	
	Electrical connection	-	
	Max. switching output at resistive load	-	
Switching capacity	-		
Protection class to DIN 40050	-		
Order example	VMF 2 E.0		


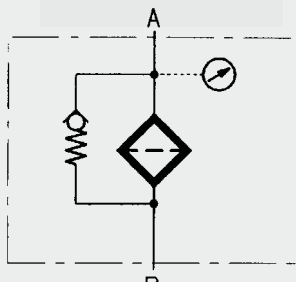
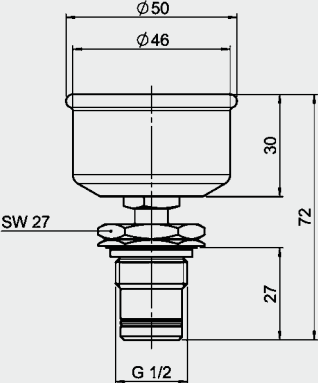

VMF 16 E.x

	Type of indication	visual/analogue, scale indication	 
	Weight	80 g	
	Pressure setting / indication range	0 bar to +16 bar	
	Permiss. operating pressure	11 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	-	
	Max. switching voltage	-	
	Electrical connection	-	
	Max. switching output at resistive load	-	
Switching capacity	-		
Protection class to DIN 40050	-		
Order example	VMF 16 E.0		


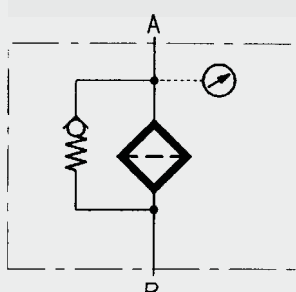
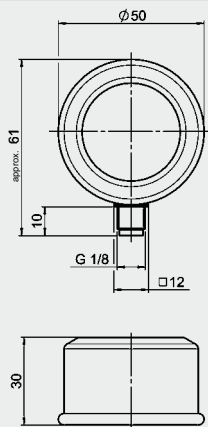

VR x E.x

 	Type of indication	visual/analogue, scale indication	 
	Weight	140 g	
	Pressure setting / indication range	0 bar to +10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/2	
	Max. torque	30 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VR 2 E.0		


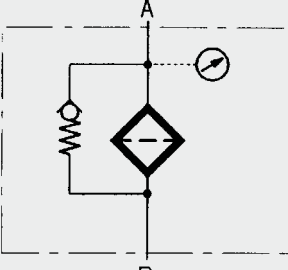
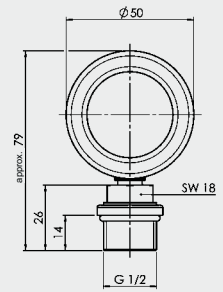
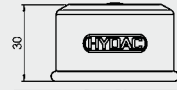

VRD x E.x

 	Type of indication	visual/analogue, scale indication	 
	Weight	140 g	
	Pressure setting / indication range	0 bar to +10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/2	
	Max. torque	33 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VRD 2 E.0		


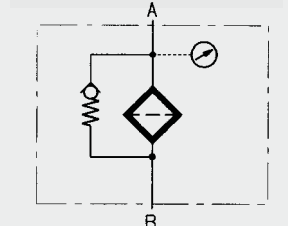
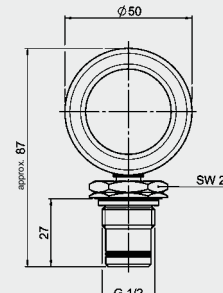
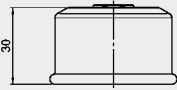

VMF x ES.x

 	Type of indication	visual/analogue, scale indication	 
	Weight	100 g	
	Pressure setting / indication range	0 bar to +10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VMF 2 ES.0		


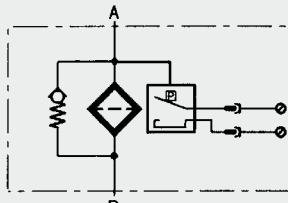
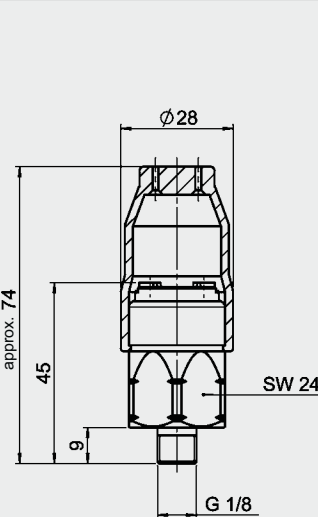
VR x ES.x

 	Type of indication	visual/analogue, scale indication	  
	Weight	120 g	
	Pressure setting / indication range	0 bar to +10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G ½	
	Max. torque	30 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VR 2 ES.0		


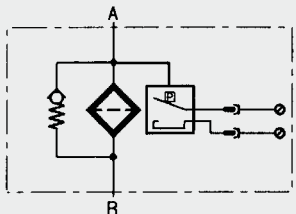
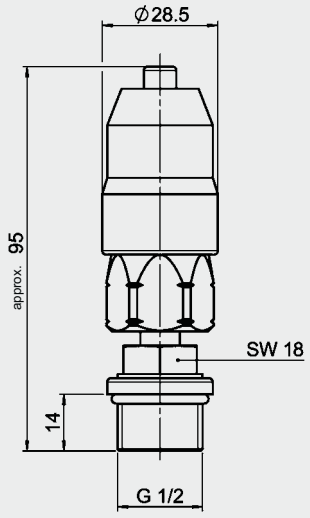
VRD x ES.x

 	Type of indication	visual/analogue, scale indication	  
	Weight	120 g	
	Pressure setting / indication range	0 bar to +10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VRD 2 ES.0		


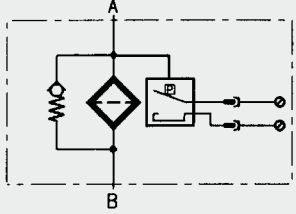
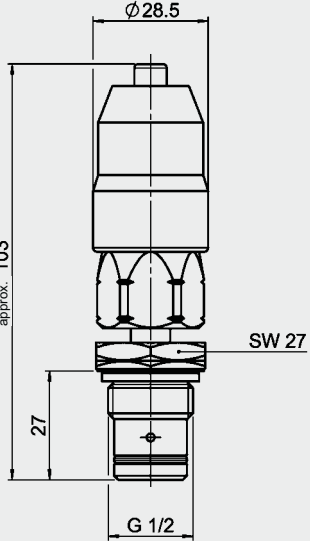
VMF x F.x

 	Type of indication	electrical switch	
	Weight	70 g	
	Pressure setting / indication range	2 bar ± 0.4 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/O contact	
	Max. switching voltage	42 V	
	Electrical connection	threaded connection	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 2.5 A at 24 V = ohmic 2.5 A at 42 V ~	
	Protection class to DIN 40050	IP 65, terminals IP 00	
Order example	VMF 2 F.0		


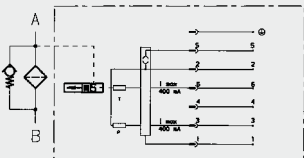
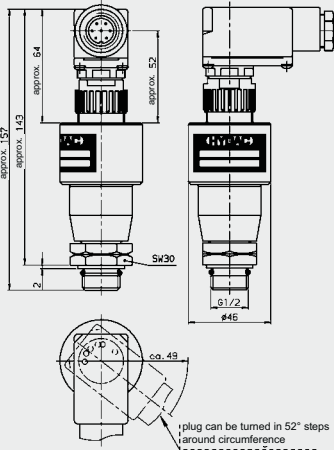
VR x F.x

 	Type of indication	electrical switch	
	Weight	130 g	
	Pressure setting / indication range	2 bar ± 0.4 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	30 Nm	
	Switching type	N/O contact	
	Max. switching voltage	42 V	
	Electrical connection	threaded connection	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 2.5 A at 24 V = ohmic 2.5 A at 42 V ~	

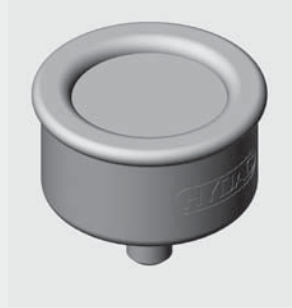
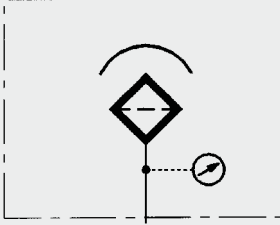
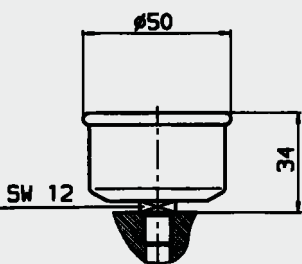

VRD x F.x

 	Type of indication	electrical switch	
	Weight	130 g	
	Pressure setting / indication range	2 bar ± 0.4 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/O contact	
	Max. switching voltage	42 V	
	Electrical connection	threaded connection	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 2.5 A at 24 V = ohmic 2.5 A at 42 V ~	
	Protection class to DIN 40050	IP 65, terminals IP 00	
Order example	VRD 2 F.0		

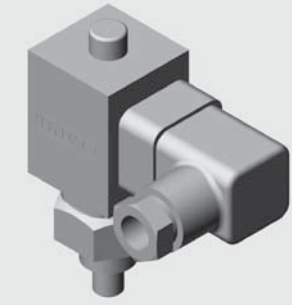
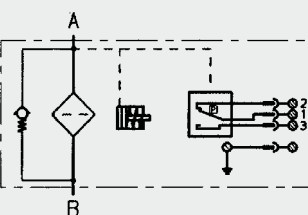
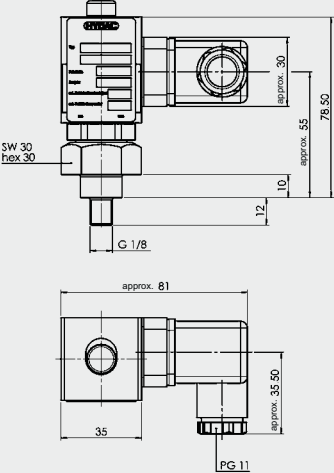
VR x GC.x

 	Type of indication	electronic/analogue (4-20 mA or 1-10 V) 1 electrical switching contact at 75% and at 100% of the pressure setting Analogue signal up to 20% of the pressure setting constant at 4mA or 1 V	 <p>plug can be turned in 52° steps around circumference</p>
	Weight	340 g	
	Pressure setting / indication range	2 bar -10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +80 °C	
	Threaded connection	G ½	
	Max. torque	15 Nm	
	Switching type	N/C or N/O electronic PNP positive switching (factory setting)	
	Max. switching voltage	operating voltage 20-30 V DC	
	Electrical connection	7 pole plug to DIN 43651	
	Max. switching output at resistive load	12 W	
	Switching capacity	ohmic 0.4 A at 30 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VR 2 GC.0 /-LED-SQ-123		

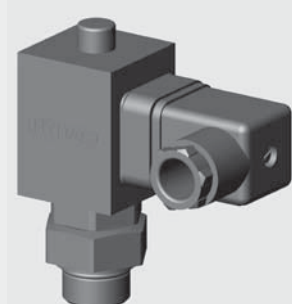
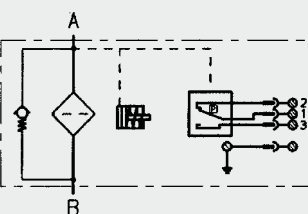
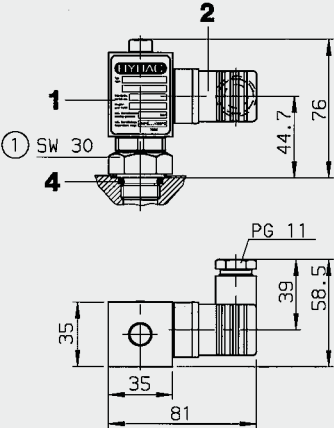
VMF x K.x

 	Type of indication	visual/analogue, scale indication	 
	Weight	100 g	
	Pressure setting / indication range	-1 bar to + 0.6 bar	
	Permiss. operating pressure	-0.7 to +0.4 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
Order example	VMF 0.6 K.0		

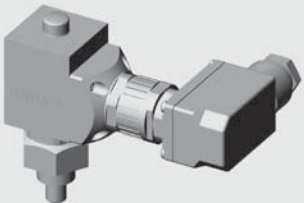
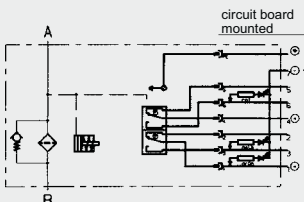
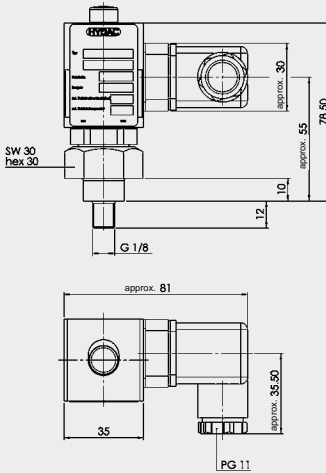
VMF x LE.x

 	Type of indication	visual, red pin and electrical switch 1 switching contact at 100% of the pressure setting	
	Weight	120 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	115 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
Max. switching output at resistive load	15 W = max. 15 VA ~		
Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~		
Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)		
Order example	VMF 2 LE.1		

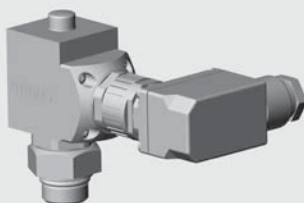
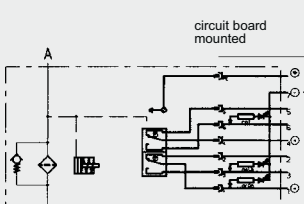
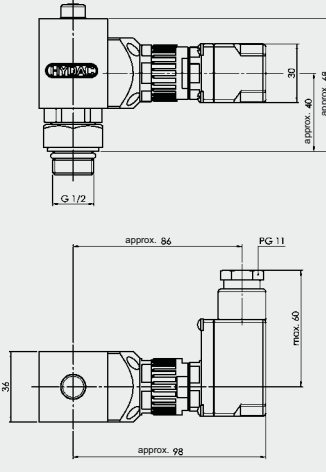
VR x LE.x

 	Type of indication	visual, red pin and electrical switch 1 switching contact at 100% of the pressure setting	
	Weight	143 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	15 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	115 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
Max. switching output at resistive load	15 W = max. 15 VA ~		
Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~		
Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)		
Order example	VR 2 LE.1		

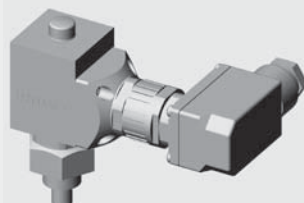
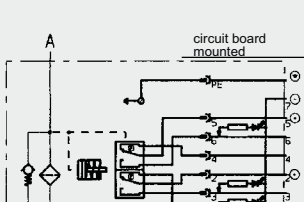
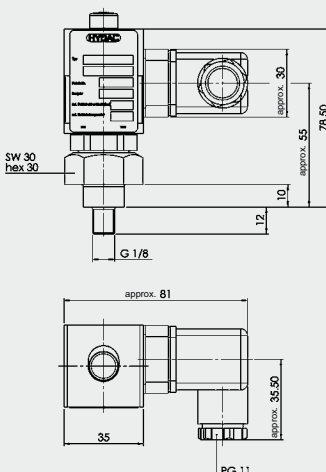
VMF x LZ.x /-DB

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	170 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43651	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VMF 2 LZ.1 /-DB	

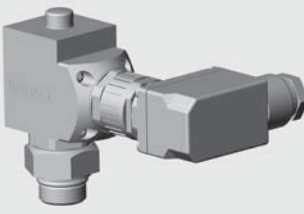
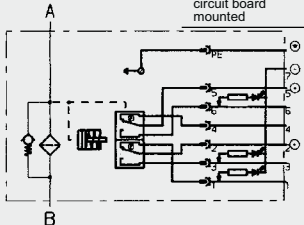
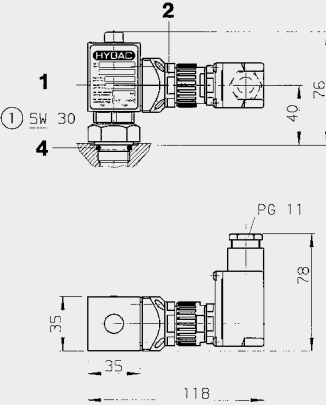
VR x LZ.x /-DB

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	190 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	15 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43651	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VR 2 LZ.1 /-DB	

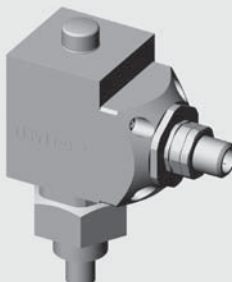
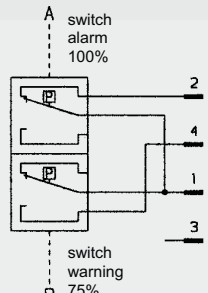
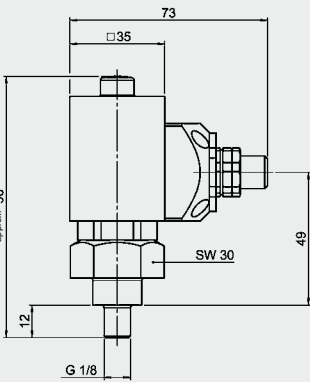
VMF x LZ.x /-CN

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED goes out on reaching 75% 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	170 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43651	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VMF 2 LZ.1 /-CN	

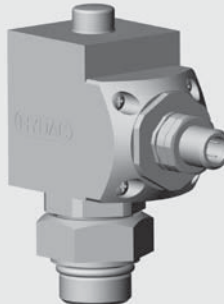
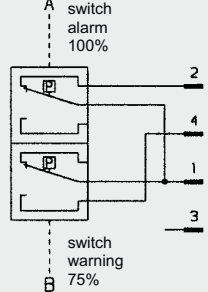
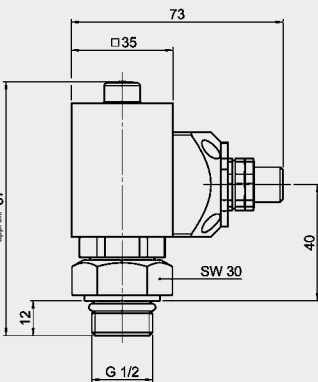
VR x LZ.x /-CN

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED goes out on reaching 75% 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	190 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	15 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43651	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VR 2 LZ.1 /-CN	

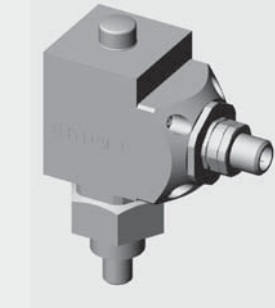
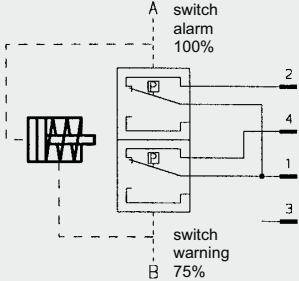
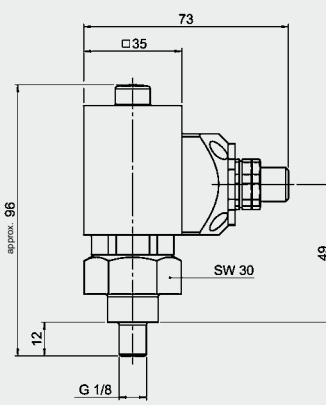
VMF x LZ.x /-BO

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting	
	Weight	120 g	
	Pressure setting / indication range	2 bar (or 2.5 bar) - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/O contact (75%) N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VMF 2 LZ.1 /-BO	

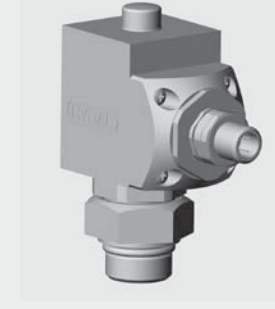
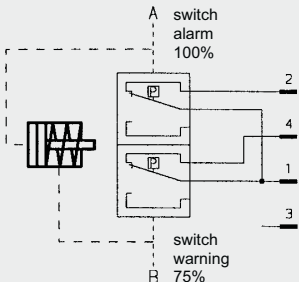
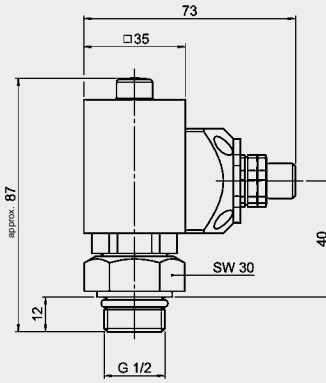
VR x LZ.x /-BO

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting	
	Weight	145 g	
	Pressure setting / indication range	2 bar (or 2.5 bar) - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	15 Nm	
	Switching type	N/O contact (75%) N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VR 2 LZ.1 /-BO	

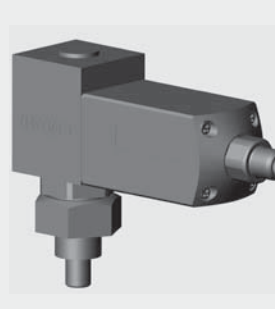
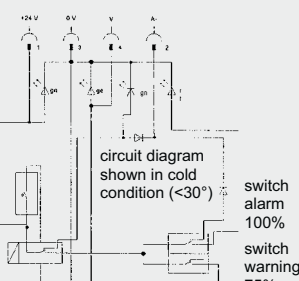
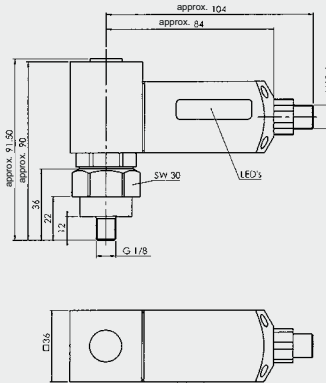
VMF x LZ.x /-AV

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting	
	Weight	120 g	
	Pressure setting / indication range	2 bar (or 2.5 bar) - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/C contact (75% and 100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VMF 2 LZ.1 /-AV	

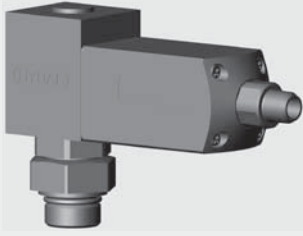
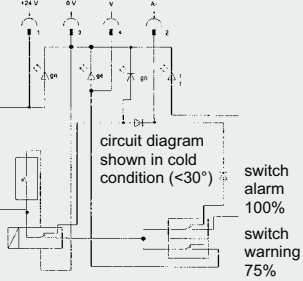
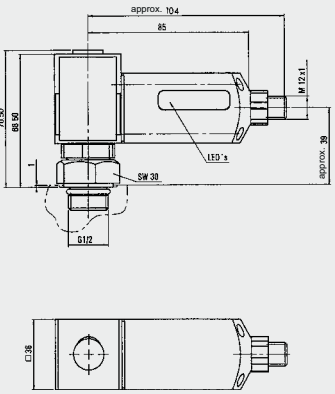
VR x LZ.x /-AV

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting	
	Weight	145 g	
	Pressure setting / indication range	2 bar (or 2.5 bar) - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	15 Nm	
	Switching type	N/C contact (75% and 100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VR 2 LZ.1 /-AV	

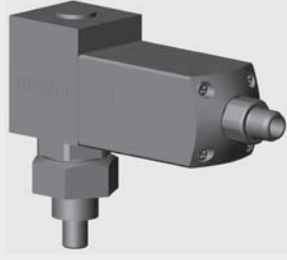
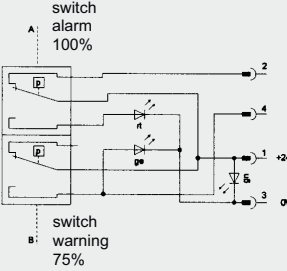
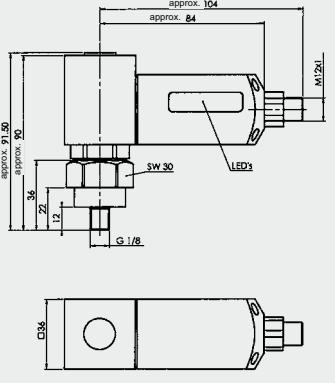
VMF x LZ.x /-D4C

 	Type of indication	1 electrical switching contact at 75% and at 100% of the pressure setting and suppression of the switching signal when operating temperature is below 30 °C 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	245 g	
	Pressure setting / indication range	2.5 bar - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/O contact (75%) N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VMF 2 LZ.1 /-D4C	

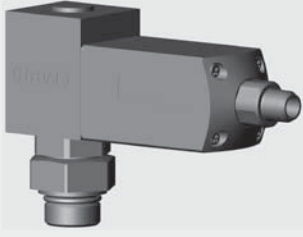
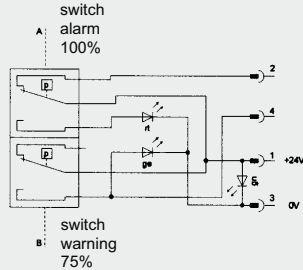
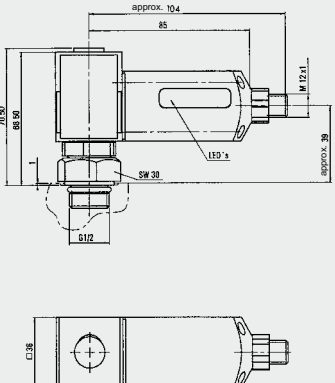
VR x LZ.x /-D4C

 	Type of indication	1 electrical switching contact at 75% and at 100% of the pressure setting and suppression of the switching signal when operating temperature is below 30 °C 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	205 g	
	Pressure setting / indication range	2.5 bar - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	15 Nm	
	Switching type	N/O contact (75%) N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VR 2 LZ.1 /-D4C	

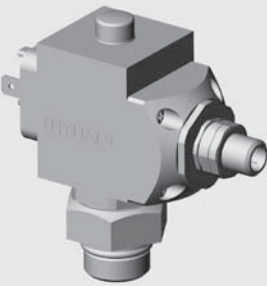
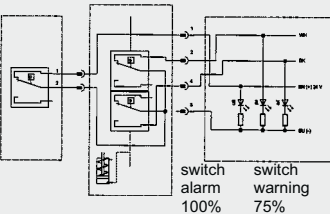
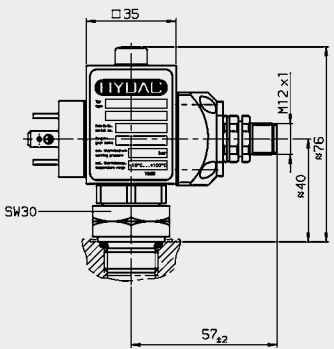
VMF x LZ.x /-BO-LED

 	Type of indication	1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	245 g	
	Pressure setting / indication range	2.5 bar - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Threaded connection	G 1/8	
	Max. torque	15 Nm	
	Switching type	N/O contact (75%), N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VMF 2 LZ.1 /-BO-LED	


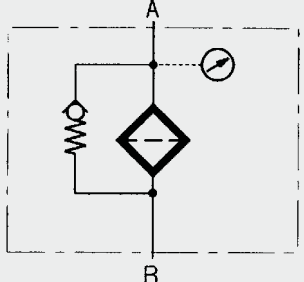
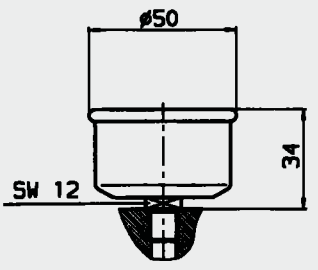

VR x LZ.x /-BO-LED

 	Type of indication	1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	205 g	
	Pressure setting / indication range	2.5 bar - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Threaded connection	G 1/2	
	Max. torque	15 Nm	
	Switching type	N/O contact (75%), N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VR 2 LZ.1 /-BO-LED	


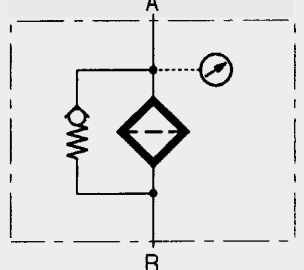
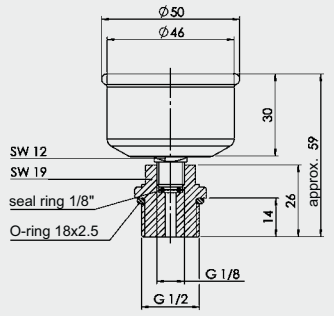

VR x LZ.x /-GM

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting Indicator function possible only in conjunction with the "No element" indicator	
	Weight	290 g	
	Pressure setting / indication range	2.5 bar - 10%	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	15 Nm	
	Switching type	-	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 67	
	Order example	VR 2 LZ.1 /-GM	

VMF x R.x

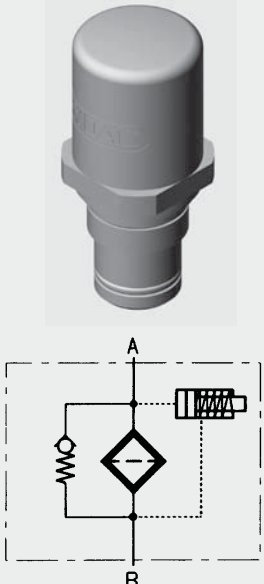
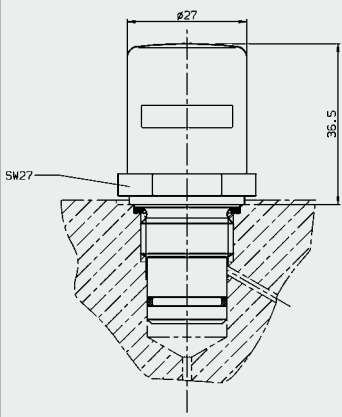
 	Type of indication	visual/analogue, scale indication	 
	Weight	80 g	
	Pressure setting / indication range	0 to 10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/8	
	Max. torque	-	
	Switching type	-	
	Max. switching voltage	-	
	Electrical connection	-	
	Max. switching output at resistive load	-	
Switching capacity	-		
Protection class to DIN 40050	-		
Order example	VMF 2 R.0		

VR x R.x

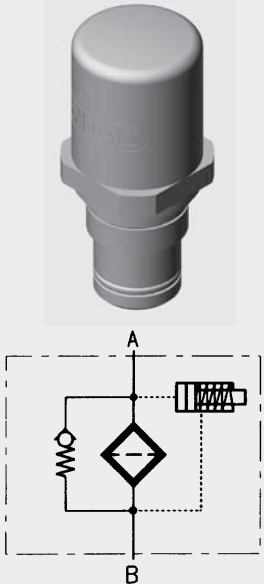
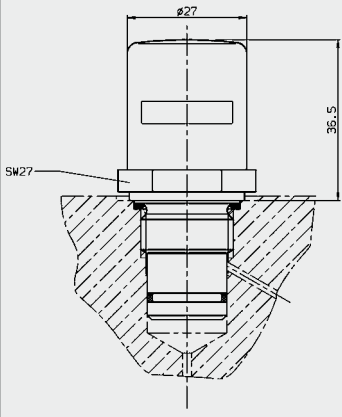
 	Type of indication	visual/analogue, scale indication	 
	Weight	140 g	
	Pressure setting / indication range	0 to 10 bar	
	Permiss. operating pressure	7 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G ½	
	Max. torque	15 Nm	
	Switching type	-	
	Max. switching voltage	-	
	Electrical connection	-	
	Max. switching output at resistive load	-	
Switching capacity	-		
Protection class to DIN 40050	-		
Order example	VR 2 R.0		

3.3 DIFFERENTIAL PRESSURE INDICATORS

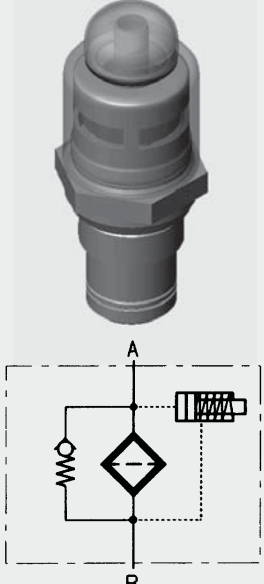
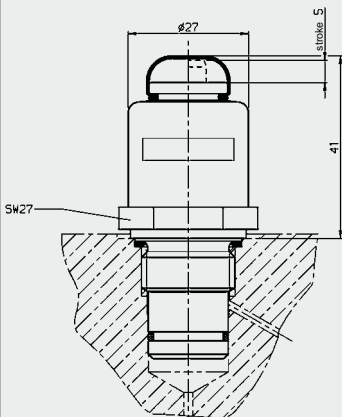
VM x B.x

	Type of indication	visual, green-red zone automatic reset	
	Weight	55 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar \pm 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	33 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VM 5 B.1	


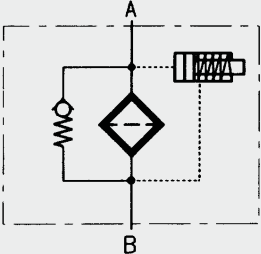
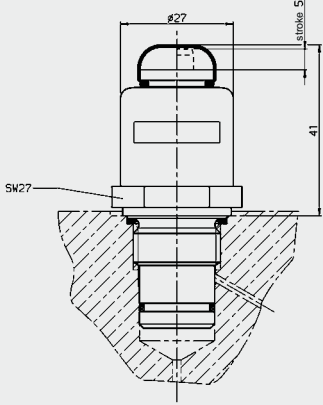
VD x B.x

	Type of indication	visual, green-red zone automatic reset	
	Weight	110 g	
	Pressure setting / indication range	5 bar - 10% 8 bar \pm 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	100 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VD 5 B.1	

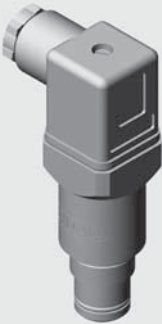
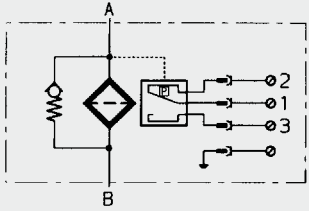
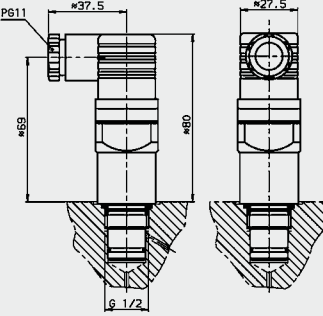
VM x BM.x

	Type of indication	visual, green-red zone manual reset	
	Weight	55 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar \pm 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	33 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VM 5 BM.1	

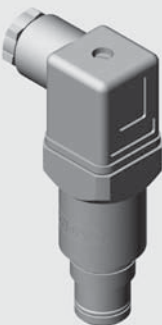
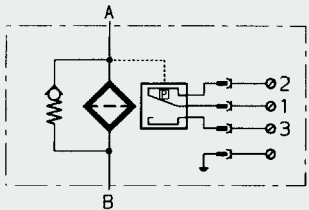
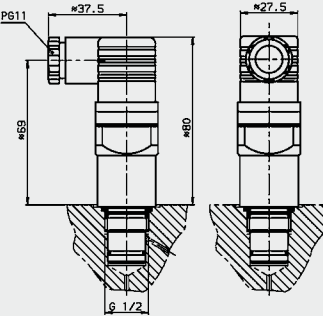
VD x BM.x

 	Type of indication	visual, green-red zone manual reset	
	Weight	110 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	-	
	Max. switching voltage	-	
	Electrical connection	-	
	Max. switching output at resistive load	-	
	Switching capacity	-	
	Protection class to DIN 40050	-	
Order example	VD 5 BM.1		

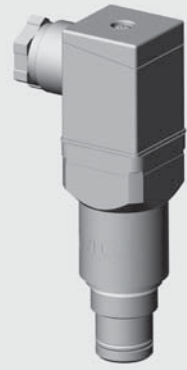
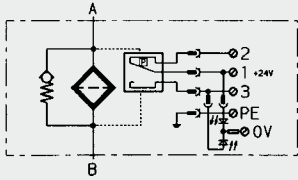
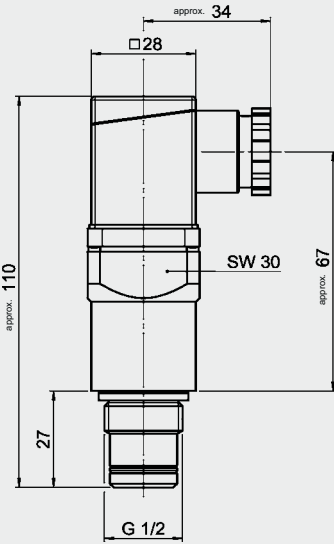
VM x C.x

 	Type of indication	electrical switch	
	Weight	120 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/C or N/O contacts (change-over contacts)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~		
Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)		
Order example	VM 5 C.0		

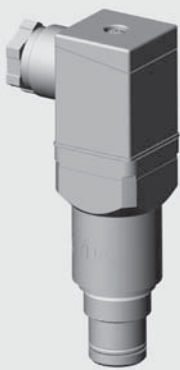
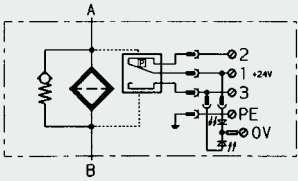
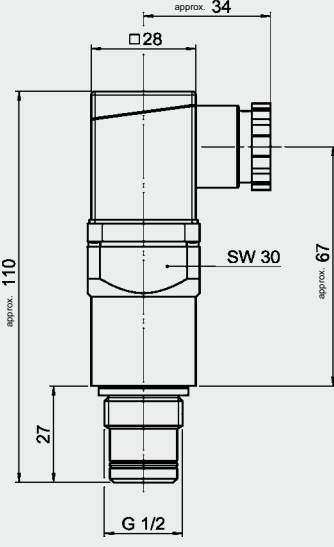
VD x C.x

 	Type of indication	electrical switch	
	Weight	220 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts contacts (change-over contacts)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~		
Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)		
Order example	VD 5 C.0		

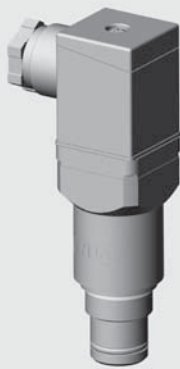
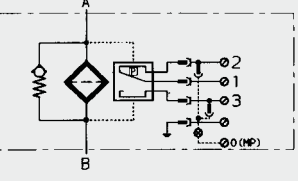
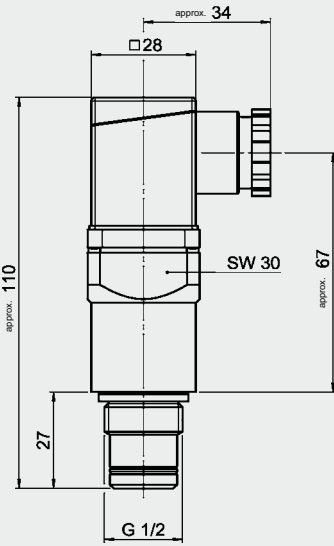
VM x D.x /-L...

 	Type of indication	visual and electrical switch	
	Weight	150 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/C or N/O contacts (change-over contact)	
	Max. switching voltage	24, 48, 110, 230 V depending on type of light insert	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VM 5 D.0 /-L24		

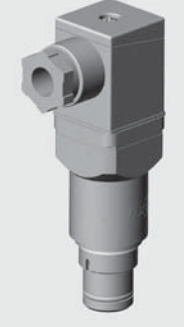
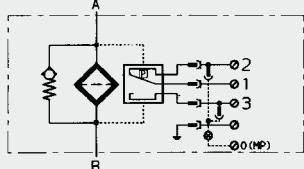
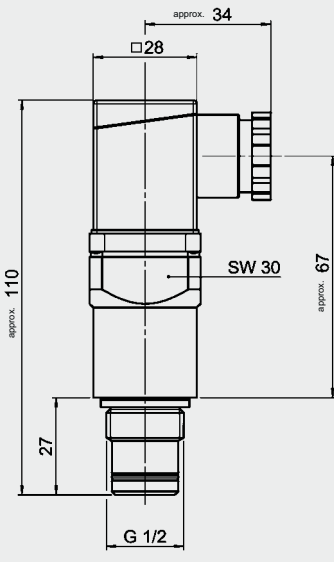
VD x D.x /-L...

 	Type of indication	visual and electrical switch	
	Weight	250 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts, (change-over contacts)	
	Max. switching voltage	24, 48, 110, 230 V depending on type of light insert	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VD 5 D.0 /-L24		


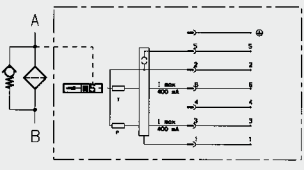
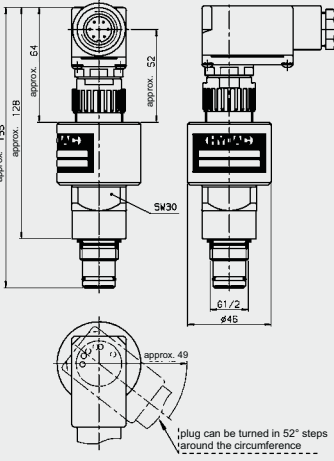
VM x D.x /-LED

 	Type of indication	visual and electrical switch	
	Weight	150 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/C or N/O contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VM 5 D.0 /-LED		


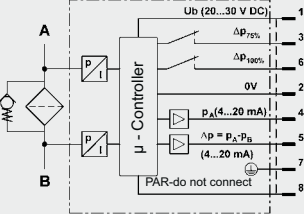
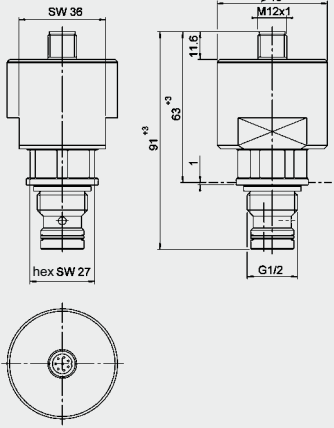
VD x D.x /-LED

 	Type of indication	visual and electrical switch	
	Weight	250 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VD 5 D.0 /-LED		

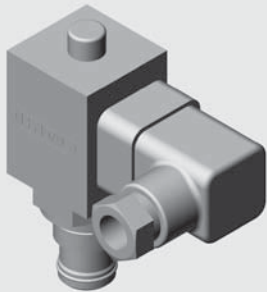
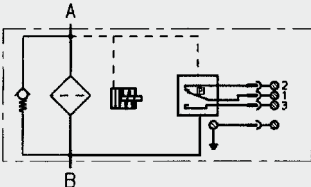
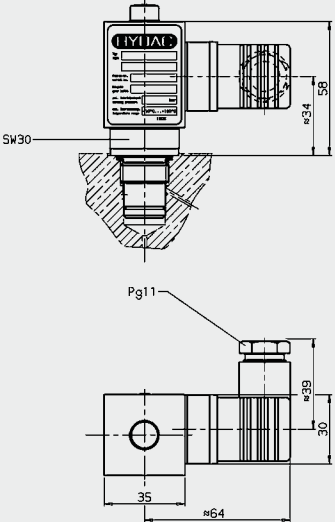
VD x GC.x

 	Type of indication	electronic/analogue (4-20 mA or 1-10 V) 1 electrical switching contact at 75% and at 100% of the pressure setting Analogue signal up to 20% of the pressure setting constant at 4 mA or 1 V	 <p>plug can be turned in 52° steps around the circumference</p>
	Weight	400 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar - 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +80 °C	
	Threaded connection	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts electronic PNP positive switching (factory setting)	
	Max. switching voltage	operating voltage 20 - 30 V DC	
	Electrical connection	7 pole plug connector to DIN 43651	
	Max. switching output at resistive load	12 W	
	Switching capacity	ohmic 0.4 A at 30 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VD 5 GC.0 /-LED-SQ-123		

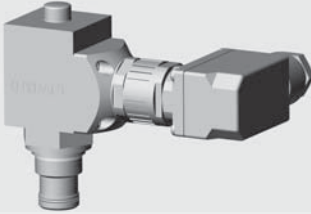
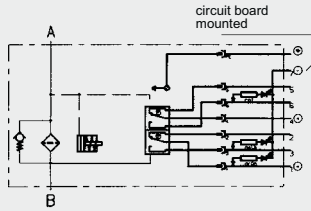
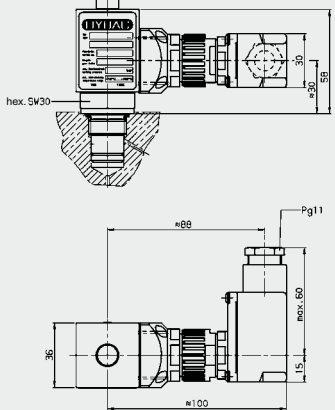
VL x GW.x

 	Type of indication	electronic/analogue (4-20 mA) for condition monitoring filters incl. bypass monitoring. 1 switching contact at 75% and at 100% of the pressure setting	
	Weight	157 g	
	Pressure setting p (switching contact 100%)	2 bar ± 5% 3 bar ± 5% 5 bar ± 5%	
	Indication range Δp	0 - 5 bar 0 - 5 bar 0 - 8 bar	
	Indication range "pressure before filter"	25 bar	
	Type of switching switching outputs Δp	electronic switch, PNP positive switching N/O or N/C contacts (factory setting)	
	Output load	400 mA	
	Max. switching voltage / operating voltage	20...30V DC	
	Analogue outputs "pressure before filter" and Δp	4...20 mA (max. 600Ω)	
	Electrical connection	M12 x 1 / 8 pole	
	Protection class to DIN 40050	IP 65	
	Permiss. operating pressure	25 bar	
	Permiss. temperature range	-40 °C to +85 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Order example	VL 5 GW.0 /-V-123	

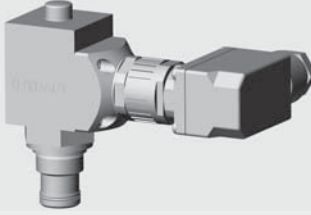
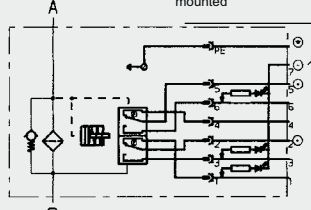
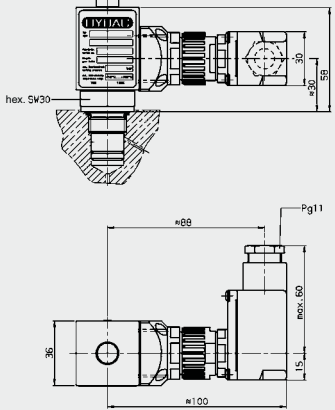
VD x LE.x

 	Type of indication	visual, red pin and electrical switch 1 switching contact at 100% of the pressure setting	
	Weight	198 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar - 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	50 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	115 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VD 5 LE.1	

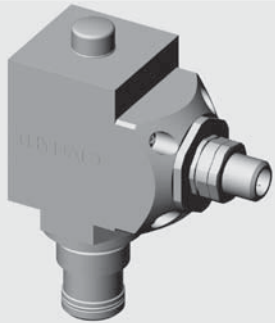
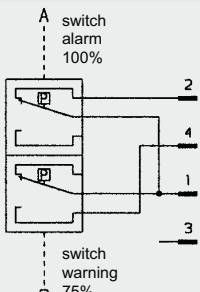
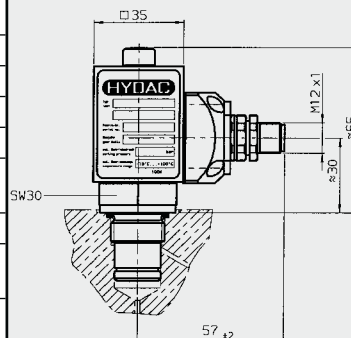
VD x LZ.x /-DB

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	245 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar - 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	50 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43651	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VD 5 LZ.1 /-DB	

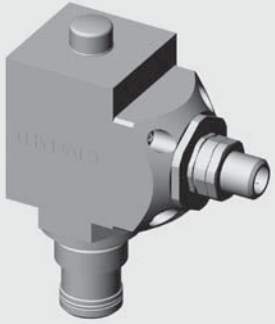
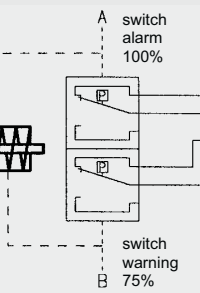
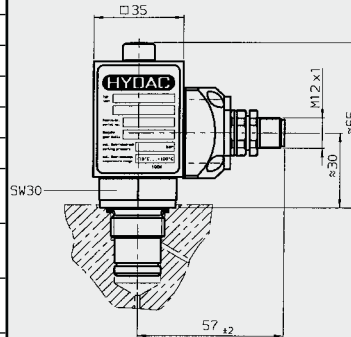
VD x LZ.x /-CN

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting 1 green LED goes out at 75% 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	245 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar - 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	50 Nm	
	Switching type	N/C or N/O contacts Reed contacts (change-over contacts)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43651	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VD 5 LZ.1 /-CN	

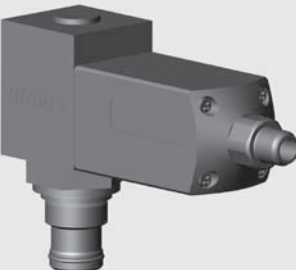
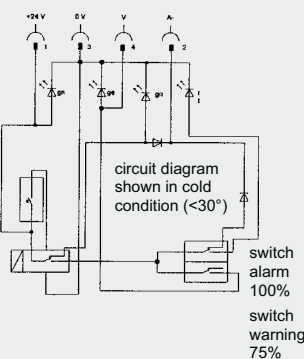
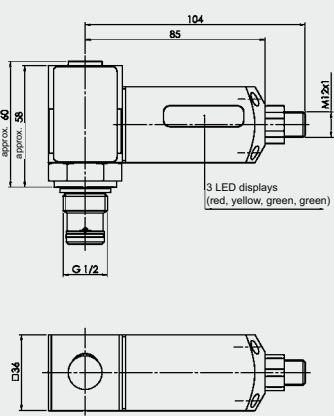
VD x LZ.x /-BO

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting	
	Weight	197 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar - 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	50 Nm	
	Switching type	N/O contact (75%) N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65	
	Order example	VD 5 LZ.1 /-BO	

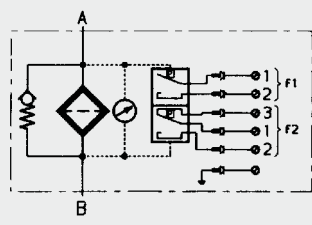
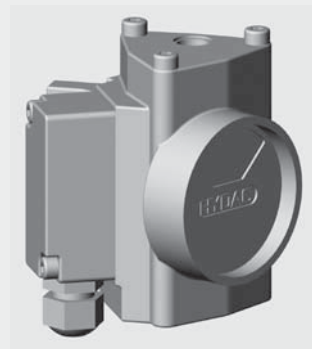
VD x LZ.x /-AV

 	Type of indication	visual, red pin and 1 electrical switching contact at 75% and at 100% of the pressure setting	
	Weight	197 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar - 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	50 Nm	
	Switching type	N/C contact (75% and 100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65	
	Order example	VD 5 LZ.1 /-AV	

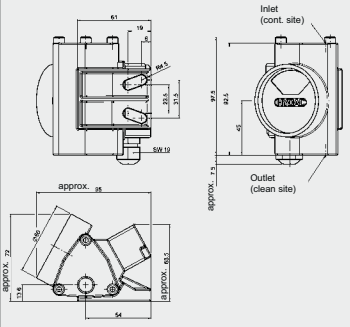
VD x LZ.x /-D4C

 	Type of indication	1 electrical switching contact at 75% and at 100% of the pressure setting and suppression of the switching signal when operating temperature is below 30 °C 1 green LED constantly lit 1 yellow LED lit from 75% 1 red LED lit from 100% Δp	
	Weight	256 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar - 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-10 °C to +100 °C	
	Connection thread	G 1/2	
	Max. torque	50 Nm	
	Switching type	N/O contact (75%) N/C contact (100%)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection M12 x 1	
	Max. switching output at resistive load	15 W = max. 15 VA ~	
	Switching capacity	ohmic 1 A at 15 V = ohmic 1 A at 15 V ~	
	Protection class to DIN 40050	IP 65	
	Order example	VD 5 LZ.1 /-D4C	

V02 x VZ.x




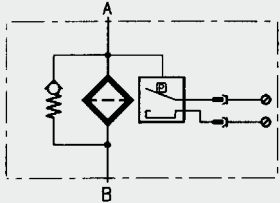
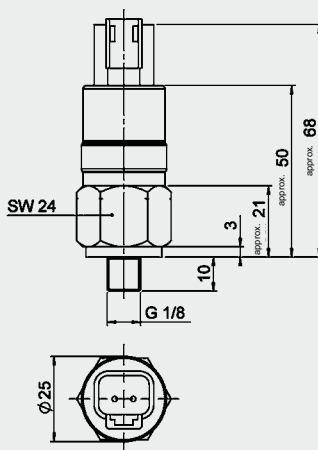
Type of indication	visual/analogue 1 electrical switching contact at 75% and 100% of the pressure setting	
Weight	650 g	
Pressure setting / indication range	0.8 bar ± 10% 2.0 bar ± 10% 4.3 bar ± 10%	
Permiss. operating pressure	160 bar	
Permiss. temperature range	-30 °C to +100 °C	
Connection thread	G ¼	
Max. torque	-	
Switching type	75% - N/O contact 100% - N/C contact	
Max. switching voltage	250 V	
Electrical connection	threaded connection PG 11	
Max. switching output at resistive load	75% contact 120 W = 120 VA ~	100% contact 30 W = 60 VA ~
Switching capacity	ohmic 2.5 A at 24 V = ohmic 1 A at 220 V ~	
Protection class to DIN 40050	IP 55	
Order example	V02 2 VZ.0	




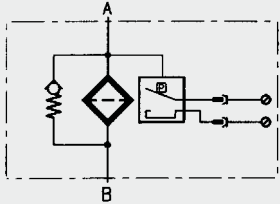
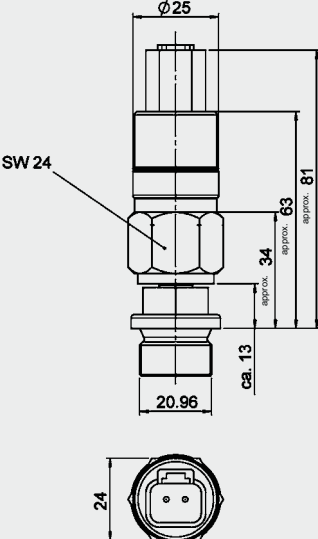
3.4 MOBILE INDICATORS

3.4.1 RETURN LINE

VMF x FD.x (plug type: Deutsch DT 04-2P)


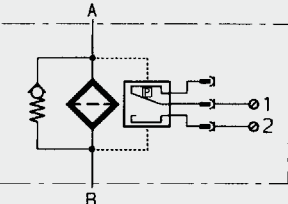
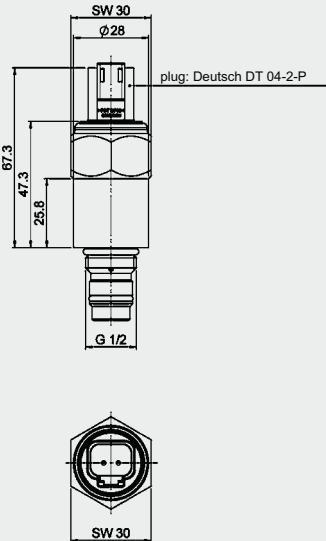
 	Type of indication	visual/analogue, scale indication	
	Weight	70 g	
	Pressure setting / indication range	2 bar ± 0.4 bar	
	Permiss. operating pressure	11 bar -continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G 1/8	
	Max. torque	30 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VMF 2 FD.0 /-2M0	

VR x FD.x (plug type: Deutsch DT 04-2P)

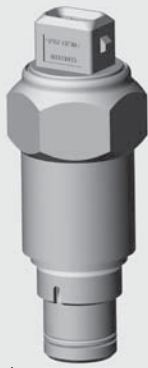
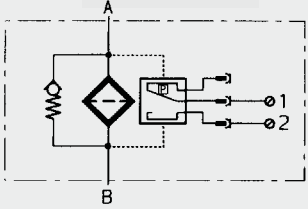
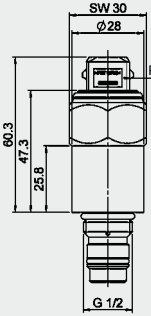

 	Type of indication	visual/analogue, scale indication	
	Weight	90 g	
	Pressure setting/ indication range	2 bar ± 0.4 bar	
	Permiss. operating pressure	11 bar continuous	
	Permiss. temperature range	-20 °C to +60 °C	
	Connection thread	G ½	
	Max. torque	30 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VR 2 FD.0 /-2M0	

3.4.2 DIFFERENTIAL PRESSURE


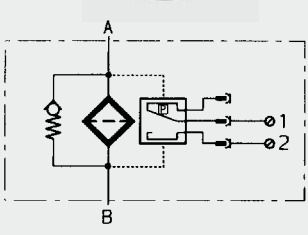
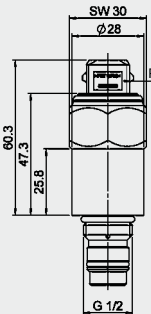

VM x CD.x (plug type: Deutsch DT 04-2P)

 	Type of indication	electrical switch	
	Weight	100 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/C or N/O contact, (change-over contact)	
	Max. switching voltage	230 V	
	Electrical connection	–	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VM 5 CD.0 /-2M0	

VM x CJ.x (plug type: Junior Power Timer)

 	Type of indication	electrical switch	 
	Weight	100 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/O or N/C contacts (change-over contact)	
	Max. switching voltage	230 V	
	Electrical connection	–	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VM 5 CJ.0 /-2M0		


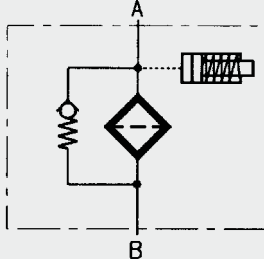
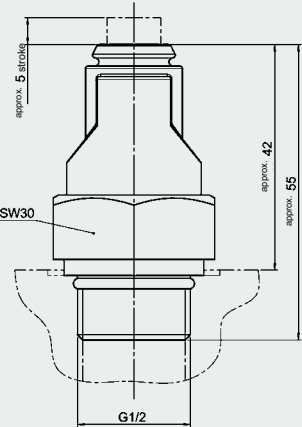
VD x CJ.x (plug type: Junior Power Timer)

 	Type of indication	electrical switch	 
	Weight	200 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/O or N/C contacts (change-over contact)	
	Max. switching voltage	230 V	
	Electrical connection	–	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VD 5 CJ.0 /-2M0		


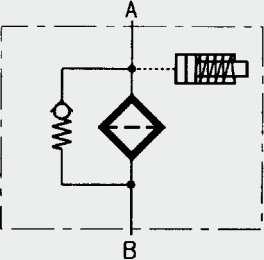
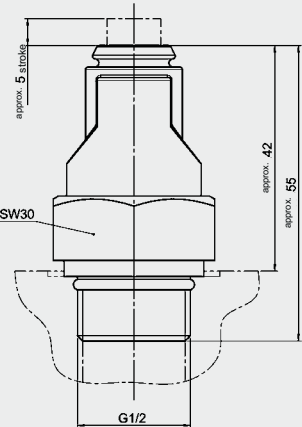
3.5 INDICATORS IN ACCORDANCE WITH ATEX DIRECTIVE

3.5.1 RETURN LINE

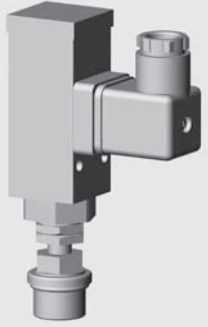
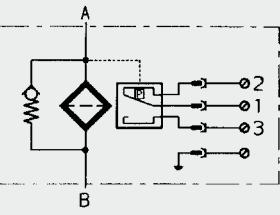
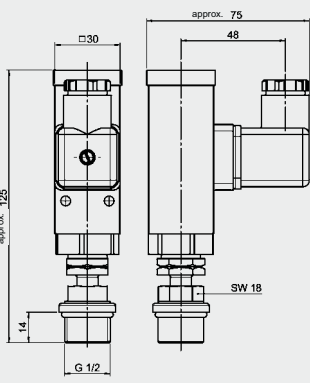
VR x B.x (ATEX) Can be used on aluminium filters up to Zone 1

 	Type of indication	visual, red pin	
	Weight	44 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	15 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VR 2 B.0 /-2GC	

VR x B.x (ATEX) Can be used on steel/cast iron filters up to Zone 1


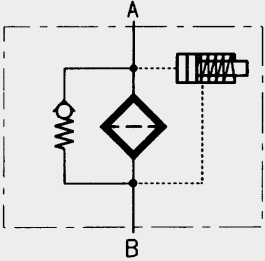
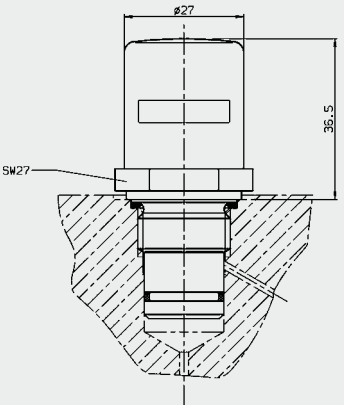
 	Type of indication	visual, red pin	
	Weight	44 g	
	Pressure setting / indication range	2 bar - 0.2 bar	
	Permiss. operating pressure	7 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	15 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VR 2 B.0 /-2GC-SO174	

VR x C.x (ATEX) Can be used on steel/cast iron filters up to Zone 1


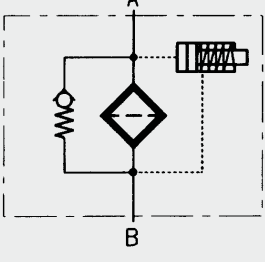
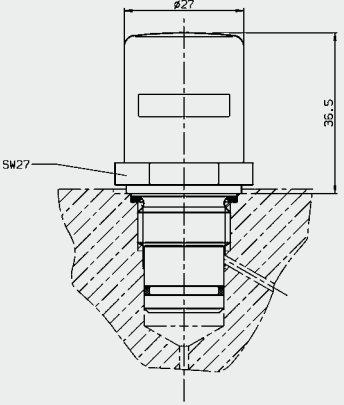
 	Type of indication	electrical switch	
	Weight	340 g	
	Pressure setting / indication range	2 bar ± 0.3 bar	
	Permiss. operating pressure	40 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	30 Nm	
	Switching type	N/C or N/O contacts, (change-over contact)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection, PG 11 socket to DIN 43650	
	Max. switching output at resistive load	250 W = 300 VA ~	
	Switching capacity	ohmic 6 A bei 24 V ohmic 0.03 to 6 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VR 2 C.0 /-2GBC	

3.5.2 DIFFERENTIAL PRESSURE

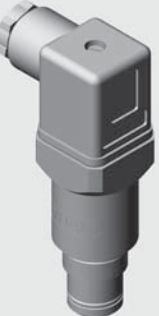
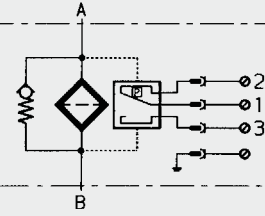
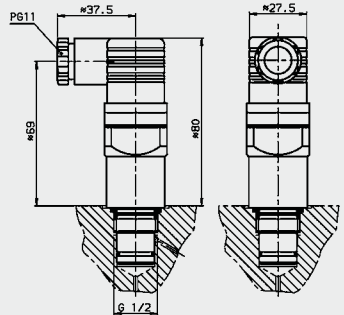
VM x B.x (ATEX) Can be used on aluminium filters up to Zone 1

 	Type of indication	visual, green-red zone automatic reset	
	Weight	110 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VM 5 B.0 /-2GC	

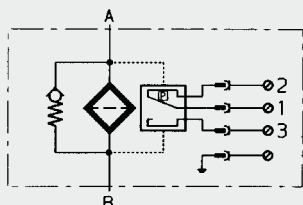
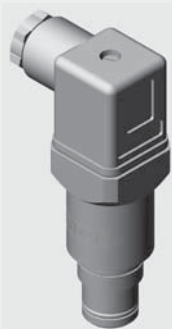
VD x B.x (ATEX) Can be used on steel/cast iron filters up to Zone 1

 	Type of indication	visual, green-red zone automatic reset	
	Weight	110 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	–	
	Max. switching voltage	–	
	Electrical connection	–	
	Max. switching output at resistive load	–	
	Switching capacity	–	
	Protection class to DIN 40050	–	
	Order example	VD 5 B.0 /-2GC	

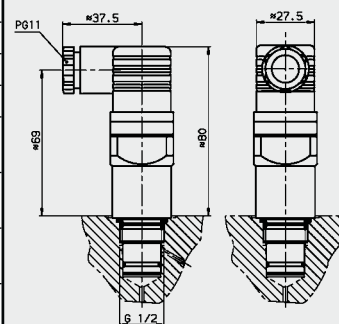
VM x C.x (ATEX) Can be used on aluminium filters up to Zone 1

 	Type of indication	electrical switch	
	Weight	120 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts (change-over contacts)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VM 5 C.0 /-2GBC-SO135	

VD x C.x (ATEX) Can be used on steel/cast iron filters up to Zone 1



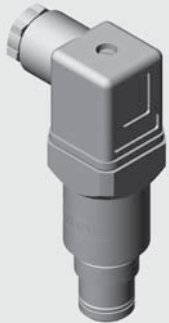
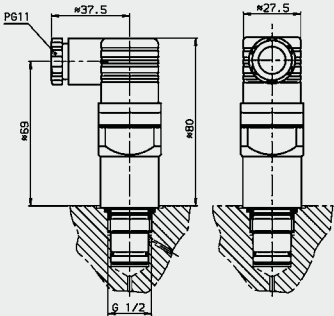
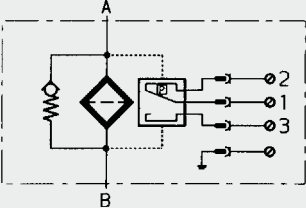
Type of indication	electrical switch
Weight	120 g
Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%
Permiss. operating pressure	420 bar
Permiss. temperature range	-30 °C to +100 °C
Connection thread	G 1/2
Max. torque	100 Nm
Switching type	N/C or N/O contacts, (change-over contact)
Max. switching voltage	230 V
Electrical connection	plug connection PG 11 socket to DIN 43650
Max. switching output at resistive load	60 W = 100 VA ~
Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~
Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)
Order example	VD 5 C.0 /-2GBC-SO135




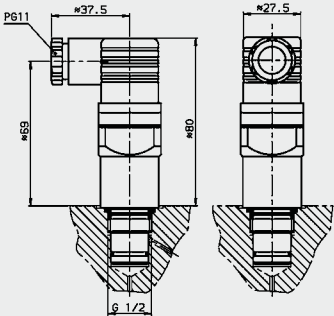
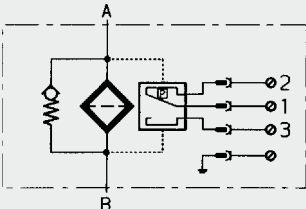
3.6 INDICATORS WITH UL APPROVAL

3.6.1 DIFFERENTIAL PRESSURE


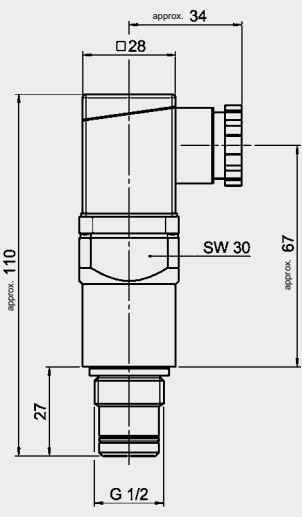
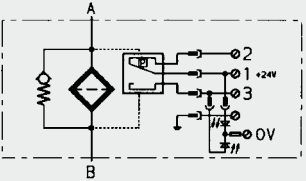
VM x C.x (UL)

	Type of indication	electrical switch	
	Weight	120 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/C or N/O contacts, (change-over contact)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VM 5 C.0 /-CRUUS	

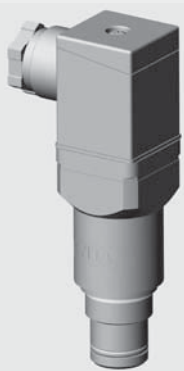
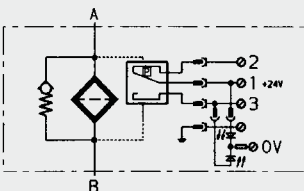
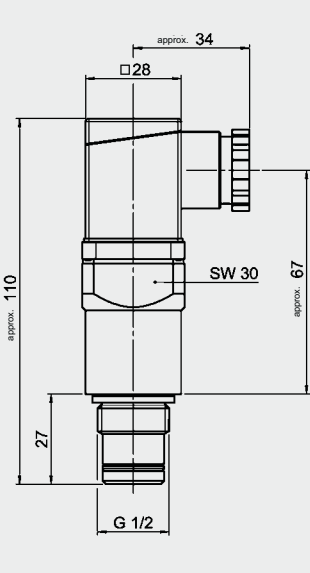
VD x C.x (UL)

	Type of indication	electrical switch	
	Weight	120 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts, (change-over contact)	
	Max. switching voltage	230 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VD 5 C.0 /-CRUUS	

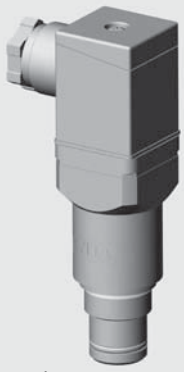
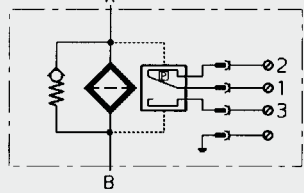
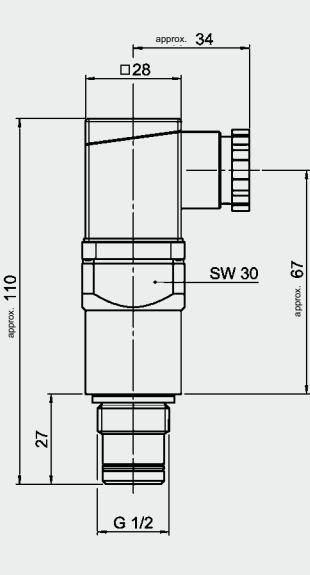
VM x D.x /-L... (UL)

	Type of indication	visual and electrical switch	
	Weight	150 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/C or N/O contacts, (change-over contact)	
	Max. switching voltage	24, 48, 110, 230 V depending on the type of light insert	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
	Order example	VM 5 D.0 /-L24-CRUUS	

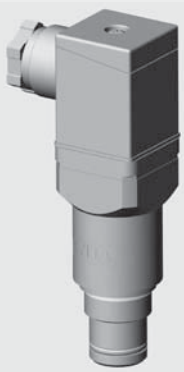
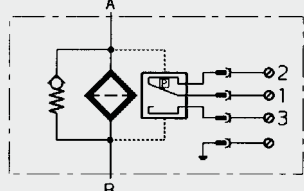
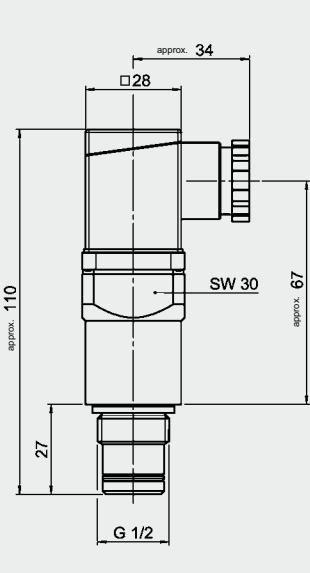
VD x D.x /-L... (UL)

 	Type of indication	visual and electrical switch	
	Weight	250 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts, (change-over contact)	
	Max. switching voltage	24, 48, 110, 230 V depending on the type of light insert	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V = ohmic 0.03 to 5 A at max. 230 V ~	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VD 5 D.0 /-L24-CRUUS		

VM x D.x /-LED (UL)

 	Type of indication	visual and electrical switch	
	Weight	150 g	
	Pressure setting / indication range	2 bar - 10% 5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	210 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	33 Nm	
	Switching type	N/C or N/O contacts, (change-over contact)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VM 5 D.0 /-LED-CRUUS		

VD x D.x /-LED (UL)

 	Type of indication	visual and electrical switch	
	Weight	250 g	
	Pressure setting / indication range	5 bar - 10% 8 bar ± 10%	
	Permiss. operating pressure	420 bar	
	Permiss. temperature range	-30 °C to +100 °C	
	Connection thread	G ½	
	Max. torque	100 Nm	
	Switching type	N/C or N/O contacts, (change-over contact)	
	Max. switching voltage	24 V	
	Electrical connection	plug connection PG 11 socket to DIN 43650	
	Max. switching output at resistive load	60 W = 100 VA ~	
	Switching capacity	ohmic 3 A at 24 V =	
	Protection class to DIN 40050	IP 65 (only if the plug is wired and fitted correctly)	
Order example	VD 5 D.0 /-LED-CRUUS		

4. MODEL CODE

VR 2 D . X /-V-L24

4.1 STANDARD CLOGGING INDICATORS

Type of clogging indicator

- VMF return line indicator; connection G 1/8
- VR return line indicator; connection G 1/2
- VRD return line indicator; for differential pressure cavity
- VM differential pressure indicator; up to 210 bar operating pressure
- VD differential pressure indicator; up to 420 bar operating pressure
- VL differential pressure indicator; up to 25 bar operating pressure
- V02 differential pressure indicator; piped separately; up to 160 bar operating pressure

Pressure setting

see particular clogging indicator

Type

- B visual with automatic reset
- BM visual with manual reset
- C electrical
- CA electrical with AMP plug (Mark II)
- CD electrical with Deutsch plug (DT 04-2P)
- CJ electrical with Junior Power Timer
- D visual/electrical
- E pressure gauge, horizontal
- ES pressure gauge, vertical
- F pressure switch
- FD pressure switch with Deutsch plug (DT 04-2P)
- GC electronic
- GW electronic
- H pressure switch
- K pressure gauge, horizontal, for breather filters
- LE visual/mechanical indicator with 100% switching contact
- LZ visual/mechanical indicator with 75% and 100% switching contact
- R pressure gauge, horizontal
- UBM visual, vacuum
- UE vacuum pressure gauge, horizontal
- UF vacuum switch
- V visual/analogue
- VE visual/analogue with 100% switching contact
- VZ visual/analogue with 75% and 100% switching contact

Modification number

- X the latest version is always supplied

Supplementary details

- 30C cold start suppression of switching outputs up to 30 °C ±5 °C
(only for C, D, LZ indicators; DC voltage supply only; on D indicators, contacts must be wired N/O only)
- EX Ex version for return line indicators, type "C"
- L... light with corresponding voltage (24, 48, 110, 230 Volt)] only for
- LED 2 light emitting diodes up to 24 Volt] type "D"
- SO135 indicator suitable for PLC controls due to Gold Crosspoint contacts
- W suitable for oil-water emulsions (HFA, HFC)
- V seal in Viton (FPM), suitable for phosphate esters (HFD-R) and biodegradable oils
(**must be specified for type "GW"**)

Supplementary details for "GC" type

- | | | | |
|--|--|--|--|
| <ul style="list-style-type: none"> 113 N/O function 123 N/C function | <ul style="list-style-type: none"> pressure peak suppression up to 10 sec. cold start suppression of switching outputs
(PNP technique, positive switching) up to 25 °C pressure peak suppression up to 10 sec. cold start suppression of switching outputs
(PNP technique, positive switching) up to 25 °C | <p>must be specified!
others on request</p> | |
| <ul style="list-style-type: none"> 30C cold start suppression of switching outputs up to 30 °C (other temperatures on request) LED 3 LEDs (green, yellow, red) in terminal box PF floating switching outputs (due to relay in the plug) SP analogue signal: voltage output 1-10 V SQ analogue signal: voltage output 4...20 mA (current source) | | | <p>if SP or SQ not specified
"current sink" model supplied</p> |

Supplementary details for "GW" type

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> 113 N/O function 123 N/C function | <ul style="list-style-type: none"> pressure peak suppression up to 10 sec. cold start suppression of switching outputs
(PNP technique, positive switching) up to 25 °C pressure peak suppression up to 10 sec. cold start suppression of switching outputs
(PNP technique, positive switching) up to 25 °C | <p>must be specified!
others on request</p> |
|--|--|--|

Supplementary details for "LZ" type

AV plug and connector to AUDI, VW specification

BO plug and connector to BMW, Opel, Ford specification

BO-LED as for BO, but with progressive LED strip

CN electrical connection, 1 connector to DIN 43651 with 3 LEDs (to CNOMO specification NF E 48-700)

DB electrical connection, 1 connector to DIN 43651 with 3 LEDs (to Daimler-Benz and BMW specification)

D4C plug and connector to Daimler-Chrysler specification with cold start suppression 30 °C

Supplementary details for "ATEX" type

2GC for visual indicator type "B" with ATEX certificate


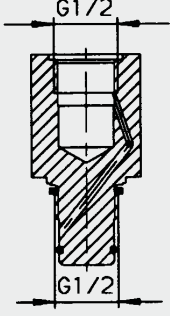

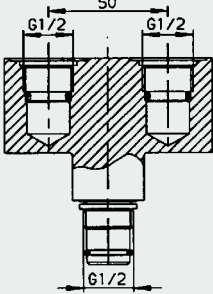
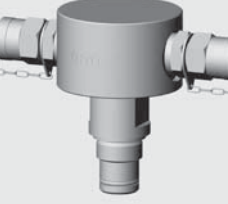
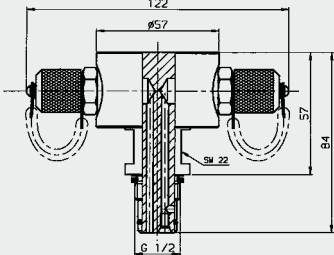
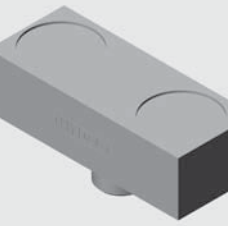
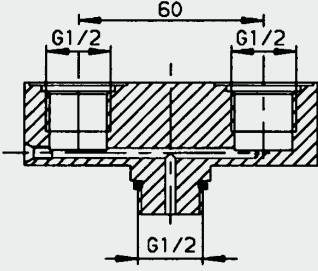

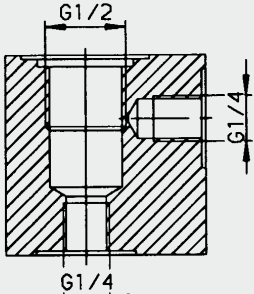
2GBC for electrical indicator type "C" with ATEX certificate (the switch used in the indicator is a passive component according to EN 50020 and can therefore be used in intrinsically safe circuits as simple apparatus in accordance with EN 60079-14)


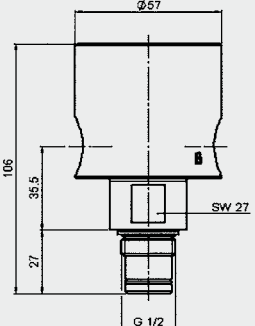
Supplementary details for "UL" approval

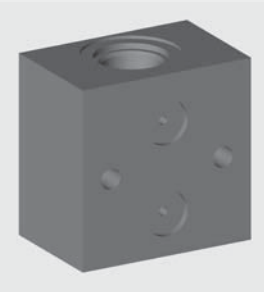
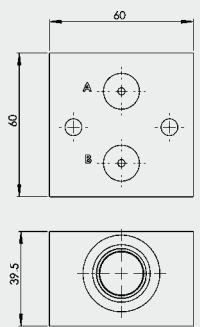
CRUUS for electrical indicator type "C" or visual/electrical indicator type "D" with UL approval

5. ADAPTORS

5.1 TYPES

	<table border="1"> <tr> <td>Designation</td> <td>ADAPTOR VD-D-S.0</td> </tr> <tr> <td>Material-Nr.</td> <td>00318736</td> </tr> <tr> <td>Explanation</td> <td> <p>Extending adaptor for differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>On the manifold mounted, rear flanged filters DF...M A, DF...MHA, DF...MHE and DF...Q E this adaptor must used!</p> </td> </tr> </table>	Designation	ADAPTOR VD-D-S.0	Material-Nr.	00318736	Explanation	<p>Extending adaptor for differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>On the manifold mounted, rear flanged filters DF...M A, DF...MHA, DF...MHE and DF...Q E this adaptor must used!</p>	
Designation	ADAPTOR VD-D-S.0							
Material-Nr.	00318736							
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	<table border="1"> <tr> <td>Designation</td> <td>ADAPTOR VD-D+D-S+S.0</td> </tr> <tr> <td>Part no.</td> <td>00318732</td> </tr> <tr> <td>Explanation</td> <td> <p>Y-adaptor to convert 1 differential pressure cavity into 2 differential pressure cavities according to HYDAC works standard HN 28-22.</p> <p>Swivel-type on request!</p> </td> </tr> </table>	Designation	ADAPTOR VD-D+D-S+S.0	Part no.	00318732	Explanation	<p>Y-adaptor to convert 1 differential pressure cavity into 2 differential pressure cavities according to HYDAC works standard HN 28-22.</p> <p>Swivel-type on request!</p>	
Designation	ADAPTOR VD-D+D-S+S.0							
Part no.	00318732							
Explanation	<p>Y-adaptor to convert 1 differential pressure cavity into 2 differential pressure cavities according to HYDAC works standard HN 28-22.</p> <p>Swivel-type on request!</p>							
	<table border="1"> <tr> <td>Designation</td> <td>ADAPTOR VD-1/4+1/4-W+W.0 /-00404337</td> </tr> <tr> <td>Part no.</td> <td>00404337</td> </tr> <tr> <td>Explanation</td> <td> <p>Test adaptor for differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>To test the pressure before and after the filter element.</p> <p>Also available without Minimes couplings (on request)!</p> </td> </tr> </table>	Designation	ADAPTOR VD-1/4+1/4-W+W.0 /-00404337	Part no.	00404337	Explanation	<p>Test adaptor for differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>To test the pressure before and after the filter element.</p> <p>Also available without Minimes couplings (on request)!</p>	
Designation	ADAPTOR VD-1/4+1/4-W+W.0 /-00404337							
Part no.	00404337							
Explanation	<p>Test adaptor for differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>To test the pressure before and after the filter element.</p> <p>Also available without Minimes couplings (on request)!</p>							
	<table border="1"> <tr> <td>Designation</td> <td>ADAPTOR VR-R+R-S+S.0</td> </tr> <tr> <td>Part no.</td> <td>00318741</td> </tr> <tr> <td>Explanation</td> <td> <p>Y-adaptor to convert 1 return line cavity into 2 return line cavities (G 1/2)</p> <p>Swivel-type on request!</p> </td> </tr> </table>	Designation	ADAPTOR VR-R+R-S+S.0	Part no.	00318741	Explanation	<p>Y-adaptor to convert 1 return line cavity into 2 return line cavities (G 1/2)</p> <p>Swivel-type on request!</p>	
Designation	ADAPTOR VR-R+R-S+S.0							
Part no.	00318741							
Explanation	<p>Y-adaptor to convert 1 return line cavity into 2 return line cavities (G 1/2)</p> <p>Swivel-type on request!</p>							
	<table border="1"> <tr> <td>Designation</td> <td>ADAPTOR V 1/4 I-D-S.0</td> </tr> <tr> <td>Part no.</td> <td>00318730</td> </tr> <tr> <td>Explanation</td> <td> <p>Connection adaptor for piping clogging indicators separately with differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>Two connections G 1/4, one before and one after the filter element</p> </td> </tr> </table>	Designation	ADAPTOR V 1/4 I-D-S.0	Part no.	00318730	Explanation	<p>Connection adaptor for piping clogging indicators separately with differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>Two connections G 1/4, one before and one after the filter element</p>	
Designation	ADAPTOR V 1/4 I-D-S.0							
Part no.	00318730							
Explanation	<p>Connection adaptor for piping clogging indicators separately with differential pressure cavity according to HYDAC works standard HN 28-22.</p> <p>Two connections G 1/4, one before and one after the filter element</p>							

	Designation	ADAPTOR VD-D+1/4+1/4-S+W+W.0	
	Part no.	00318744	
	Explanation	Extending adaptor for differential pressure cavity according to HYDAC works standard HN 28-22. Also two connections, one before and one after the filter element.	

	Designation	ADAPTOR VF-D-S.0 /-RT	
	Part no.	on request	
	Explanation	only for the following filters: LFR, LPFR, MDFR, RFLR, RFMR, RKMR, SFFR	

5.2 MODEL CODE (= EXAMPLE)

ADAPTOR VD-D+1/4+1/4-S+W+W.X /-ESB

Connection

- VD differential pressure indicator; connection G 1/2
- VR return line indicator; connection G 1/2
- V1/4 differential pressure indicator; connection G 1/4 internal
- VF differential pressure indicator; flange type

Ports (several ports are possible!)

- D differential pressure cavity G 1/2
- R return line cavity G 1/2
- MF cavity for pressure gauge and pressure switch
- 1/4 cavity G 1/4 for Minimes test points (M16 x 1,5)
- 1/8 cavity G 1/8 for Minimes test points (plug-in connection)

Orientation of the ports

- S vertical
- W horizontal

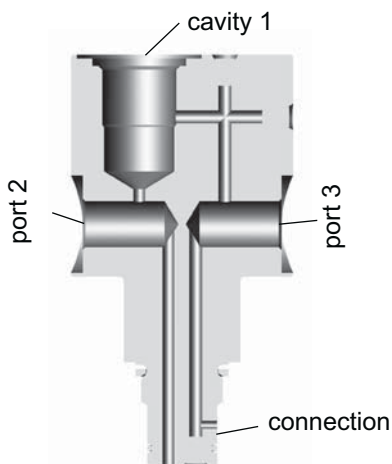
Type code

- X the latest version is always supplied

Supplementary details

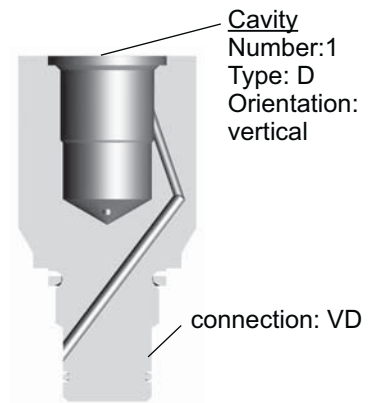
- ESB swivel type
- V seal in Viton (FPM), suitable for phosphate ester (HFD-R) and biodegradable oils

VD-D+1/4+1/4-S+W+W.0

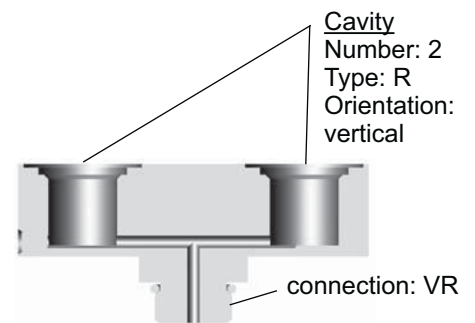


5.3 OTHER EXAMPLES

VD-D-S.0



VR-R+R-S+S.0

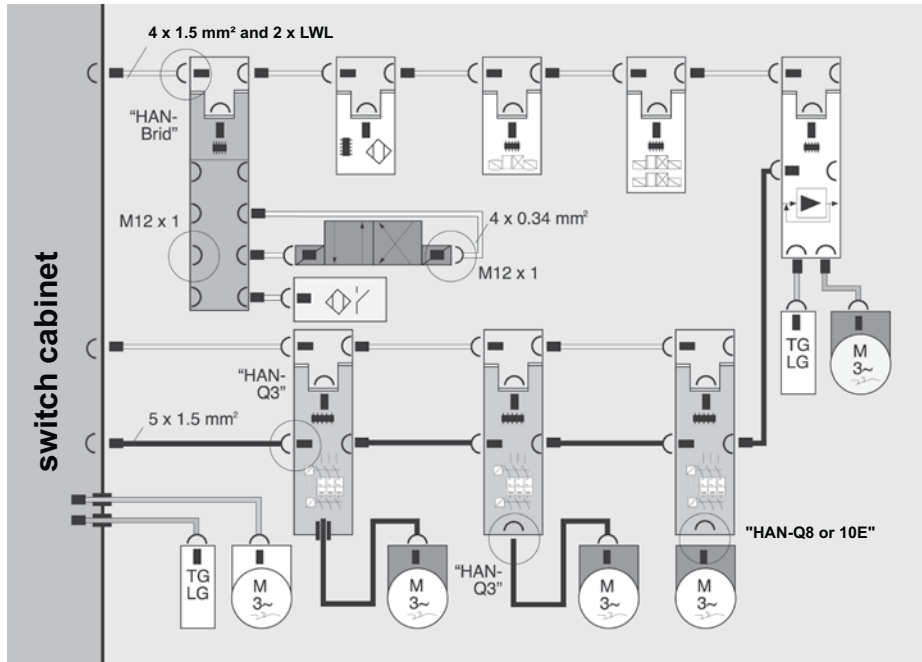


6. DESINA SPECIFICATION

DESINA is a fully comprehensive system intended to bring standardisation and decentralisation to the field of fluid technology and to electrical installation of machinery and systems. The system engineering, automotive and supply industries have worked together to draw up specifications of the necessary components. DESINA makes use of tried-and-tested solutions, such as open bus systems, standard industrial plugs etc.

By standardising components, interfaces and connection systems, such as a hybrid field bus cable (Cu/LWL), a wide range of different field bus systems can be made compatible on a single physical base.

6.1. TOTAL CONCEPT FOR MACHINE TOOL INSTALLATION



6.2. CLOGGING INDICATORS

The following clogging indicators are approved to DESINA specification:

VD 5 LZ.1 /-D4C
 VR 2.5 LZ. 1 /-D4C
 VD 5 LZ.1 /-BO
 VR 2.5 LZ. 1 /-BO
 VD 5 LZ. 1 /-AV
 VR 2.5 LZ. 1 /-AV
 VR 2.5 LZ. 0 /-GM

all with M 12 x 1 connector!



DESINA

The DESINA logo is shown on the type code label of approved clogging indicators.

NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

HYDAC Filtertechnik GmbH
 Industriegebiet
 D-66280 Sulzbach/Saar
 Tel.: 0 68 97 / 509-01
 Fax: 0 68 97 / 509-300
 Internet: www.hydac.com
 E-Mail: filter@hydac.com