

Float switch

with two switching contacts, two programmable switching outputs for temperature, alternatively one programmable switching output and one analog output with display and control unit

RE 50220/07.10

1/10

Type ABZMS-40

Component series 1X
Maximum operating pressure 1 bar



HAD 7707/09

Table of contents

Content	Page
Features	1
Ordering code	2
Standard types	3
Technical data	4 to 5
Mating connectors	5
Unit dimensions	6
Contact assignment	7
Function level contacts	8
Function display and control unit	8
Spare parts	8
Assignment to tanks	9
Assembly instructions	10
Normative references	10

Features

Float switches are switching devices operated by a float moved by fluid. They serve the control of filling levels in power unit tanks.

The ABZMS-40 float switches sense fluid levels in tanks of the small power units Type ABSKG... size 20, 40 and 60 according to data sheet RE 51013.

The float switches have to pre-set switching contacts for level and two programmable switching outputs for temperature.

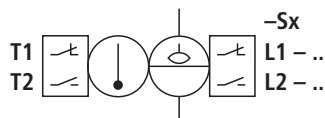
Alternative:

Float switch with two pre-set switching contacts for level, one programmable switching output for temperature and one analog output 4...20 mA.

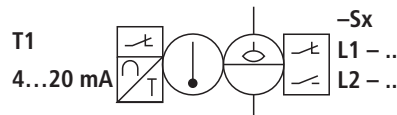
Information on available spare parts:
www.boschrexroth.com/spc

Symbol

Two pre-set level contacts and
two programmable temperature switching outputs



Two pre-set level contacts and
one programmable temperature switching output
and one analog output 4...20 mA



Ordering code

ABZM **S** **-40-1X/** **F** **S** **-T2-K24**

Power unit accessories

Measuring devices = **ABZM**

Float switch = **S**

Version = **40**

Component series 10 to 19 = **1X**
(10 to 19: unchanged installation and connection dimensions)

Level

Minimum contact

Switching point L1 in mm [inch] e.g. 120 mm [4.72]

Normally closed contact = **F**

Maximum contact

Switching point L2 in mm [inch] e.g. 50 mm [1.97]

Normally open contact = **S**

Electrical connection ^{1) 2)}

K24 = Connector
4-pole M12x1

Temperature

T2 = Temperature display and two programmable switching outputs

T1A = Temperature display, one programmable switching output and one analog output 4...20 mA

¹⁾ Mating connectors, separate order, see page 5

²⁾ Pinout, see page 7

Order example:

- Float switch with connection thread M20x1.5 with two pre-set switching contacts.
- Switching point L1 = 120 mm normally closed contact.
- Switching point L2 = 50 mm normally open contact.
- Temperature display and two programmable switching outputs.
- Connector K24.

ABZMS-40-1X/120F050S-T2-K24, Material no. **R901245523**

Standard types and standard units are contained in the EPS (standard price list).

Standard types

The switching points of the float switches are adjusted to the ABSKG... small power units according to data sheet RE 51013.

Float switches with min/max switching points for level, temperature display and two programmable temperature switching outputs:

Selection for ABSKG	Switching point in mm [inch]		Type	Material number
	L1	L2		
ABSKG 20...	120 [4.72]	50 [1.97]	ABZMS-40-1X/120F050S-T2 -K24	R901245523
ABSKG 40... and ABSKG 60...	165 [6.50]	85 [3.35]	ABZMS-40-1X/165F085S-T2 -K24	R901245524

Float switches with min/max switching points for level, temperature display, one programmable temperature switching output as well as one analog temperature output 4...20 mA:

Selection for ABSKG	Switching point in mm [inch]		Type	Material number
	L1	L2		
ABSKG 20...	120 [4.72]	50 [1.97]	ABZMS-40-1X/120F050S-T1A -K24	R901245527
ABSKG 40... and ABSKG 60...	165 [6.50]	85 [3.35]	ABZMS-40-1X/165F085S-T1A -K24	R901245528

Float switches with min/max pre-warning switching points for level, temperature display and two programmable temperature switching outputs:

Selection for ABSKG	Switching point in mm [inch]		Type	Material number
	L1	L2		
ABSKG 20...	120 [4.72]	90 [3.54]	ABZMS-40-1X/120F090S-T2 -K24	R901245525
ABSKG 40... and ABSKG 60...	165 [6.50]	135 [5.32]	ABZMS-40-1X/165F135S-T2 -K24	R901245526

Float switches with min/max pre-warning switching points for level, temperature display, one programmable temperature switching output as well as one analog temperature output 4...20 mA:

Selection for ABSKG	Switching point in mm [inch]		Type	Material number
	L1	L2		
ABSKG 20...	120 [4.72]	90 [3.54]	ABZMS-40-1X/120F090S-T1A -K24	R901245529
ABSKG 40... and ABSKG 60...	165 [6.50]	135 [5.32]	ABZMS-40-1X/165F135S-T1A -K24	R901245530

Technical data

general		
Media temperature range	°C [°F]	-20 to +80 [-4 to +176]
Installation position		Vertical ±10 °
Ambient temperature range	°C [°F]	-20 to +70 [-4 to +158]
Material	- Pipe	CU alloy
	- Float	PU rigid foam
	- Connection housing	Anodized aluminum
Seal material		NBR seals
Maximum switching point L1	mm [inch]	450 [19.68]
Weight with L1 = 300 mm	kg [lbs]	0.16 [0.35]

hydraulic				
Maximum operating pressure	bar [psi]	1 [14.5]		
Hydraulic fluid				
- Density	g/cm ³	> 0.8		
- Resistance				
• Mineral oils		Mineral oil	HLP according to DIN 51524	Resistant
• Flame-resistant hydraulic fluids		Emulsions	HFA-E according to DIN 24320	Not resistant
		Water solutions	HFC	
		Phosphoric acid ester	HFD-R	
		Organic esters	HFD-U	Resistant
• Fast biodegradable hydraulic fluids		Triglycerides (rape seed oil)	HETG	Not resistant
		Synthetic esters	HEES	
		Polyglycols	HEPG	

electrical	
Protection class according to DIN EN 60529	IP 65
Plug-in connection	4-pole M12x1 (material: metal) (K24)

Reed contacts of the float switches		
Switching voltage range	VDC	10 to 50
Max. switching current	A	0.5
Max. switching power	W/VA	5/5

Display and control unit		
Supply voltage	VDC	10 to 32
Display range	°C [°F]	-20 to +120 [-4 to +248]
Alarm adjustment range: - Temperature	°C [°F]	0 to 100 [32 to 212]
Housing design		PA, IP65 (antistatic)
Display		4 digits, seven-segment LED display
Current consumption upon switch-on		approx. 100 mA for 100 ms
Current consumption in operation		approx. 50 mA with UB 24 V
Operation		3 buttons
Temperature sensor		PT100 class B; DIN EN 60751
Accuracy		1 % of the measurement range end value

Technical data

Version T2

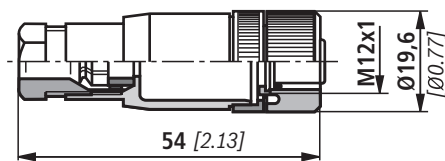
Switching point		2 programmable switching outputs (for temperature)
Max. switching current	A	0.5

Version T1A

Switching point		1 programmable switching output (for temperature)
Max. switching current	A	0.5
Output signal	mA	4...20 (alternatively, 0...10, 2...10 or 0...5 V can be set)
Temperature measuring range	°C [°F]	0...100 [32...212]
Max. load	Ω	(UB-10) / 0.02 A

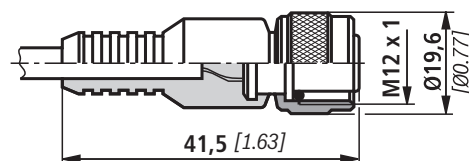
Mating connectors (dimensions in mm [*inch*]) – For detailed information see RE 08006

Mating connector for connector K24



Description	Material no.
LEITUNGSDOSE 4P Z24 SPEZ	R900031155

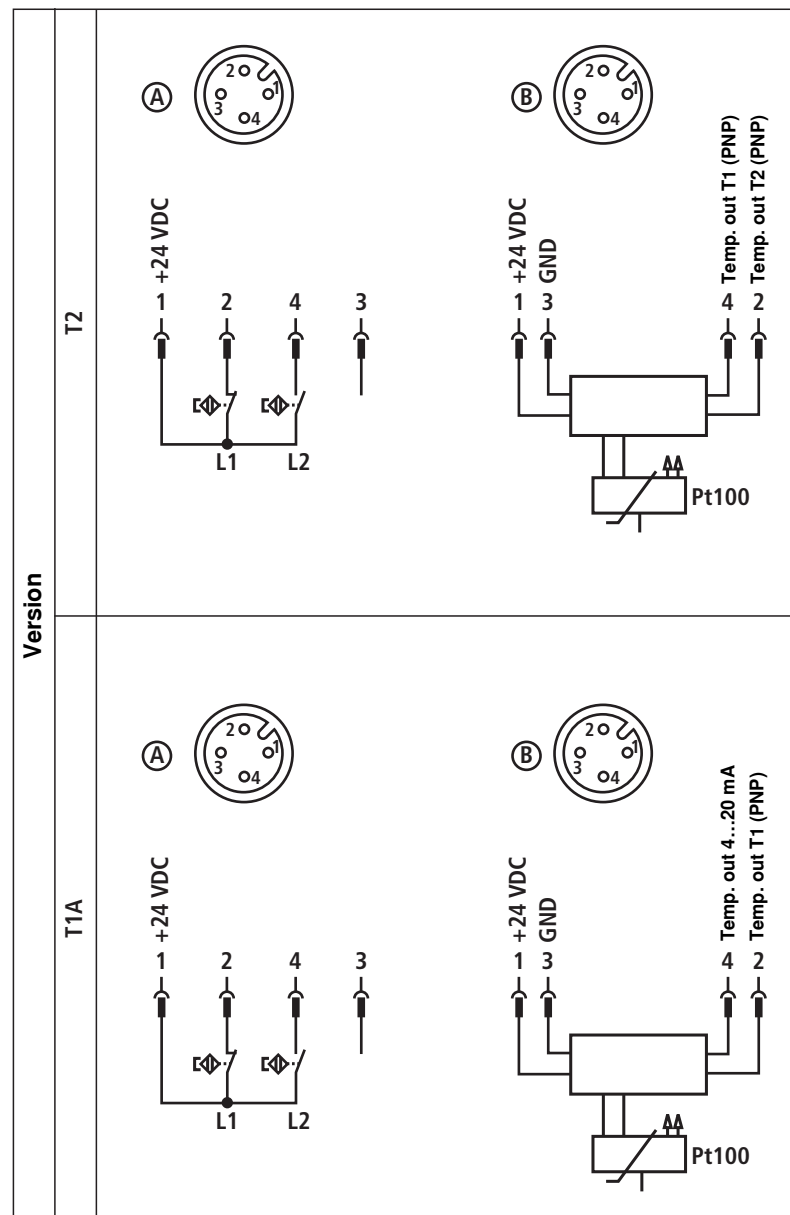
Mating connector for connector K24 with potted-in PVC cable, 3 m long



Description	Material no.
LEITUNGSDOSE 4P Z24M12X1 + 3MSPEZ	R900064381

Contact assignment

Switching function plug-in connection M12x1 (K24)



Function level contacts

If with falling oil level, the float reaches the switching points, the contacts are operated magnetically. The spool positions of the contacts are maintained until the float exceeds the switching points again as the oil level rises. Switching point

L1 is set as contact function normally closed contact at min. and switching point L2 as contact function normally open contact at max. level.

Function display and control unit

The microprocessor-controlled display and control unit processes the analog input signal for the analysis of the temperature control. The temperature settings can be made at the control unit in a simple menu tree by means of pushbuttons and read at the LED display.

The display and control unit has a red, four-digit seven-segment LED display and 3 pushbuttons for the operation as well as up to 4 LEDs integrated in the front plate for displaying alarm conditions.

The device has moreover two freely adjustable PNP switching outputs plus the adjustable switch-back points. One PNP output can be programmed as frequency output. Alternatively one freely programmable PNP switching output and one 4...20 mA output for the continuous temperature measurement. The switching conditions are shown in the display.

The 4...20 mA output can optionally be changed to 0...10 V, 2...10 V or 0...5 V.

In the display, the desired unit (°C, °F) will be shown according to the setting of the measured temperature. By default, the temperature display is set to °C.

During the setting and/or programming of the corresponding process parameters, the parameter values and/or the related menu items will be shown in the display.

In case of an energy supply failure, all input values will be stored, the min/max values can be retrieved from a permanent memory, if necessary.

Parameterization

The menu navigation is based on the VDMA standard sheet for fluid sensors 24574-1.

The operating menu is designed hierarchically, as tree structure.

That means that frequently used functions and adjustment points can be accessed very quickly and rarely used menu items can be found in a sub-menu.

Using the ▲ and ▼ keys, the corresponding parameter is set and/or the next menu item is displayed.

Using the ► key, the marked menu item is selected and/or the set parameter is accepted and saved.

The parameter may be a numerical value and a selection of functions (e.g. NO [output as normally open contact], NC [output as normally closed contact] or i1 [analog output 4...20 mA]).

After confirmation of a parameter or selection of a function using the ► key, the display switches back to the current menu item. Then, you can display the next menu item using ▲ and ▼ and select it using ►.

Spare parts

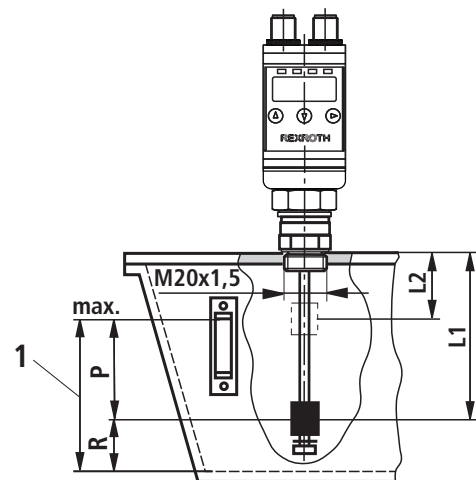
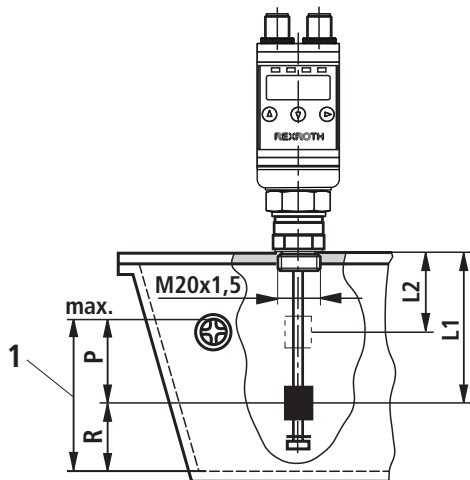
- When ordering spare parts for the float switch, the complete type designation has to be specified.
- Profile seal M20 x 1.5 NBR, Material no. **R900012471**

Assignment to tank

Float switch with min/max switching points

Tank size 20

Tank size 40 and 60



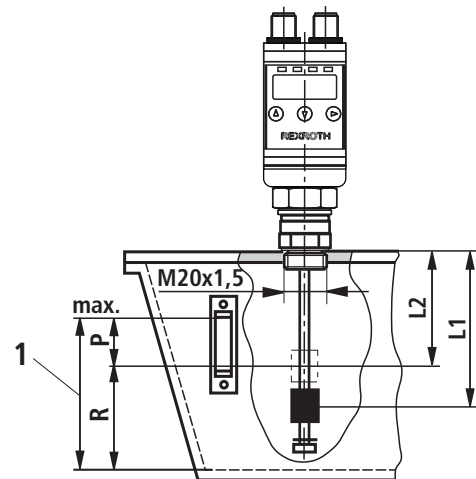
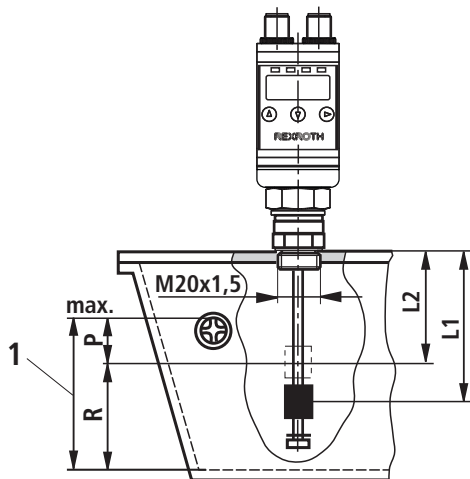
1 Maximum oil level

Float switch ABZMS-40-1X/...	Tank size (RE 51013) Size	Max. oil volume in liters [US gal]	Oscillating volume P in liters [US gal]	Residual volume R in liters [US gal]	Switching point L1 in mm [inch]	Switching point L2 in mm [inch]
120F050S-K24	20	18.0 [4.76]	6.8 [1.8]	11.2 [2.96]	120 [4.72]	50 [1.97]
165F085S-K24	40	33.0 [8.72]	12.2 [3.22]	20.8 [5.49]	165 [6.50]	85 [3.35]
165F085S-K24	60	54.0 [14.27]	17.0 [4.5]	37.0 [9.77]	165 [6.50]	85 [3.35]

Float switch with min pre-warning switching points

Tank size 20

Tank size 40 and 60



1 Maximum oil level

Float switch ABZMS-40-1X/...	Tank size (RE 51013) Size	Max. oil volume in liters [US gal]	Oscillating volume P in liters [US gal]	Residual volume R in liters [US gal]	Switching point L1 in mm [inch]	Switching point L2 in mm [inch]
120F090S-K24	20	18.0 [4.76]	4.0 [1.06]	14.0 [3.7]	120 [4.72]	90 [3.54]
165F135S-K24	40	33.0 [8.72]	8.0 [2.11]	25.0 [6.6]	165 [6.50]	135 [5.32]
165F135S-K24	60	54.0 [14.27]	11.0 [2.91]	43.0 [11.34]	165 [6.50]	135 [5.32]

Assembly information

- Vertical installation according to technical data page 4
- Avoid flows
- Do not expose the switch to strong impact and bends
- Avoid external magnetic fields. They may impair the function of the reed contacts.

Electrical connections:

- Electrical connections may only be performed by specialists.
- Tighten round connector M12x1 after connection
- Only plug in the round connector M12x1 if it is de-energized
- Do not overload the contacts (see technical data page 4)
- Tightening torque of the screwed plug 25 Nm
- **In case of inductive load, provide for a protective circuit!**

Use in explosive areas according to directive 94/9/EC (ATEX)

The float switches according to ABZMS-40 are not suitable for the use in explosive areas.

Normative references

RE 08006

Mating connectors for controlling electrically operated valves and sensors

DIN EN 60529

Degrees of protection provided by enclosures

RE 51013

Modular standard power units

VDMA 24317

Fluid technology – Flame-resistant fluids – Technical minimum requirements

DIN 24320

Flame-resistant fluids - Hydraulic fluids of categories HFAE and HFAS – Properties and requirements

VDMA 24568

Fluid technology – Fast biodegradable hydraulic fluids – Technical minimum requirements

DIN 51524

Hydraulic fluids; hydraulic oils

VDMA 24574-1

Fluid technology – Terms, menu navigation and electrical connection for fluid sensors

DIN EN 60751

Industrial platinum resistance thermometers and platinum temperature sensors (IEC 60751:2008)