

# Side mounting T62, T64 and T67

Installation and Operating Manual



*Liquid*

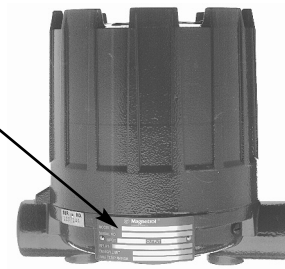
*Level*

*Switches*

## UNPACKING

Side mounting liquid level switches are shipped from the factory with the float and float stem removed from the chamber assembly and packed separately in the same container. Unpack the instrument carefully. Make sure all components have been removed from the packing material. Inspect all components for damage. Report any concealed damage to the carrier within 24 hours. Check the contents of the packing slip and report any discrepancies to the factory. Check the nameplate model number to be sure it agrees with the packing slip and purchase order. Check and record the serial number for future reference when ordering parts.

Nameplate:  
- part number  
- serial n°



These units are in conformity with the provisions of:

1. Directive 2014/34/EU for equipment or protective system intended for use in potentially explosive atmospheres. EC-type examination certificate number ISSeP09ATEX024X (Ex d units) or KIWA18ATEX0022X (Ex i units).

**CAUTION: The float stem protruding from the head assembly is extremely fragile. DO NOT handle or place in a position such that any amount of force is placed on the stem. Proper operation of the control requires that the stem is not damaged or bent.**

## SPECIAL CONDITIONS FOR ATEX INTRINSICALLY SAFE USE

When the product is installed in an area requiring EPL Ga and the enclosure is made of aluminium, all precautions shall be taken in order to avoid all impacts or frictions which can result in the ignition of the potentially explosive atmosphere.

## INTRODUCTION

Side mounting controls mount horizontally to any tank or vessel through a threaded or flanged pipe connection. Standard models are normally equipped with a single switch mechanism for high or low level alarm or control applications. Tandem models with two switch mechanisms are available for two level stage applications, providing the operating functions of two separate instruments such as high and low level alarm.

## PRINCIPLE OF OPERATION

Side mounting units employ permanent magnetic force as the only link between the float and the switching element. As the pivoted float follows, liquid level changes, it moves a magnetic sleeve ① into or out the field of a switch actuating magnet ② causing switch operation. A non-magnetic barrier tube ③ effectively isolates the switch mechanism from the controlled liquid.

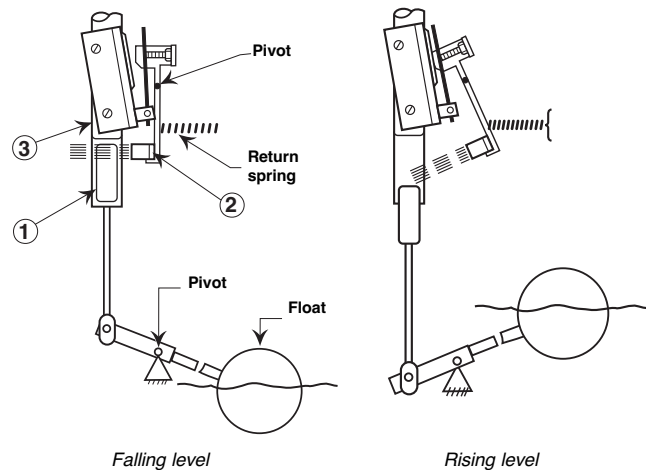


Figure 1

## MOUNTING

**CAUTION: Operation of all buoyancy type level devices should be done in such a way as to minimize the action of dynamic forces on the float or displacer sensing element. Good practice for reducing the likelihood of damage to the control is to equalize pressure across the device very slowly.**

Before assembling control to tank or vessel, check threaded or flanged mounting nozzle for the following:

- Nozzle length and inside diameter must be sized correctly to allow for switch actuation at design levels within the maximum differential available (see table on page 5).
- Nozzle should be checked for horizontal alignment. Finished mounting must allow control switch housing to be within 3° degrees of vertical for proper operation. A three degree slant is noticeable by eye, but installation should be checked with a spirit level.

Before installation, assemble float and stem to sensing unit. See **figure 2**.

1. Remove screw from end of fulcrum bar and replace with float stem.
2. Make sure end of float stem sets completely in groove of fulcrum pin as shown in **figure 2**.
3. Tighten lock nut with wrench. If float stem is properly located, fulcrum pin can not be pushed out.

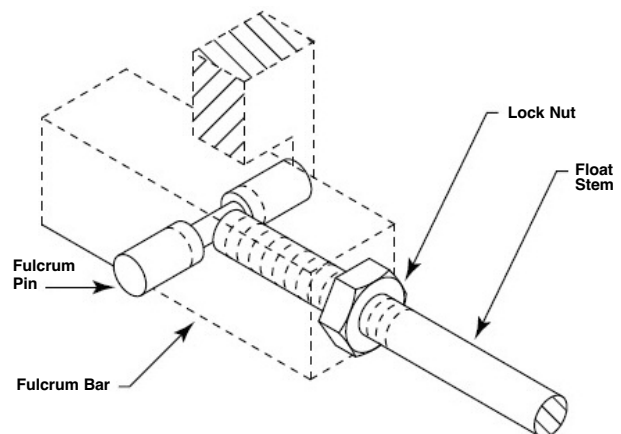


Figure 2  
Float Stem Assembly

**CAUTION: All units are shipped from the factory with the enclosing tube tightened and the switch housing set screw locked to the enclosing tube. Failure to loosen the set screw prior to repositioning the supply and output connections may cause the enclosing tube to loosen, resulting in possible leakage of the process liquid or vapor.**

*NOTE: If control is equipped with pneumatic switch mechanism, disregard these instruction and refer to instruction bulletin BE 42-685 and BE 42-686 on mechanism furnished for air (or gas) connections.*

The units are shipped with the cable entry of the switch housing placed 90° opposite the tank connections to simplify installation in most cases. If the location of the cable entry on the level switch is appropriate to the installation, proceed to Step 4 to begin wiring the unit. If another configuration is desired, the switch housing can be easily rotated by first following Steps 1, 2, and 3.

1. Loosen set screw(s) at base of switch housing. Refer to Figure 3.
2. Switch housing may be rotated 360° to allow correct positioning of cable entry.
3. Tighten set screw(s) at base of switch housing.
4. Unscrew and remove switch housing cover. The threads have been lubricated to facilitate removal.

**CAUTION: DO NOT attempt to unscrew cover of ATEX explosion proof housings before loosening locking screw in cover (Figure 3 - ATEX cast aluminium) or base (Figure 4 - ATEX cast iron) of housing. ALWAYS retighten locking screw after replacing cover.**

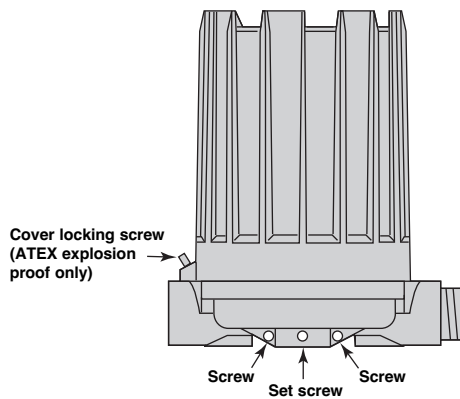


Figure 3  
Cast aluminium switch housing

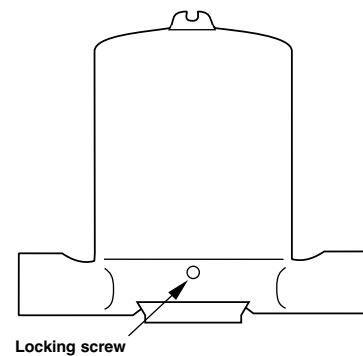


Figure 4  
ATEX cast iron switch housing

*NOTE: For supply connections use wire with a minimum rating of 75 °C, as required by process conditions. Use a minimum of 14 AWG wire for power and ground field wires. On high temperature applications (above 120 °C [250 °F] at mounting flange or bushing), high temperature wire should be used between control and first junction box located in a cooler area.*

5. The switch terminals are located next to the cable entry to facilitate wiring. Bring supply wires through cable entry. Route extra wire around enclosing tube under the baffle plate, and connect them to the proper terminals. Refer to the wiring diagram.
6. Dress wiring to ensure no interference or contact with the switch actuation arm, or replacement of switch housing cover.

*NOTE: Observe all applicable electrical codes and proper wiring procedures.*

Prevent moisture seepage into the enclosure by installing approved cable glands.

**CAUTION: For units with explosion proof housing, do not power the unit until the cable gland is sealed and the enclosure cover is screwed down securely.**

7. Replace housing cover and retighten locking screw in case of ATEX explosion proof housing.
8. Test switch action by varying liquid level in the tank or vessel.

*NOTE: If switch mechanism fails to function properly, check vertical alignment of control housing and consult installation bulletin on switch mechanisms furnished.*

9. Check cover to base fit to be certain gasketed joint is tight. A positive seal is necessary to prevent infiltration of moisture laden air or corrosive gasses into switch housing.

For wiring diagrams, refer to the specific bulletin listed in the chart below:

Switch Series Letter	Description	Bulletin No.
B, C, D, F, R, U, W, X, 8, 9	Dry Contact Switch	BE 42-683
HS	Hermetically Sealed Snap Switch	BE 42-694
V	Inductive Proximity Switch	BE 42-798
J	Bleed Type Pneumatic Switch	BE 42-685
K	Non-Bleed Type Pneumatic Switch	BE 42-686

## SWITCH DIFFERENTIAL ADJUSTMENT

The level differential setting of the side mounting controls can be field adjusted within limits specified in the table at right by repositioning the jam nuts on the magnetic sleeve stem.

**NOTE:** The control need not be removed from tank or vessel to make differential adjustment.

**CAUTION:** Before attempting any work on the control, be certain to pull disconnect switch or otherwise assure that electrical circuit(s) through control is deactivated. Close operating medium supply valve on controls equipped with pneumatic switch mechanisms.

1. Disconnect wiring from supply side of switch mechanism and electrical conduit or operating medium line connections to switch housing.
2. Perform system shut-down as required to relieve pressure from tank or vessel and drain off liquid "head" above control mounting position. Allow unit to cool.
3. Remove switch housing assembly by loosening hex nut located immediately below housing base.

With switch housing removed, jam nuts and magnetic sleeve are now accessible, as in **figure 5**. Raising the lower jam nuts or lowering the upper jam nuts will reduce the differential. Jam nut adjustments in opposite directions will, of course, increase the differential. As the first step in any adjustment procedure, the position of the lower jam nuts (dimension "A") should be established.

4. Loosen and remove upper jam nuts, guide washer and magnetic sleeve. Dimension "A", as measured from top of stem to top of lower jam nuts, may now be increased or decreased as desired.

Tandem model units have two switch mechanisms actuated by two independent magnetic sleeves. For adjustment purposes, each sleeve and jam nut set is considered as an individual unit in conjunction with the switch mechanism it operates.

**NOTE:** Be certain to tighten jam nuts securely after adjustment.

5. Replace magnetic sleeve on stem and position upper jam nuts to desired "B" dimension by measuring from top of sleeve to bottom of upper jam nuts. Lock upper jam nuts to guide washer.
6. Reassemble control in reverse of steps 1 through 3, previously described.
7. Test switch actuation by varying liquid level in tank or vessel.

**CAUTION:** After increasing differential adjustment, be certain to check carefully for proper operation of switch mechanism. Magnet must "snap" cleanly with additional float movement available after magnet snaps.

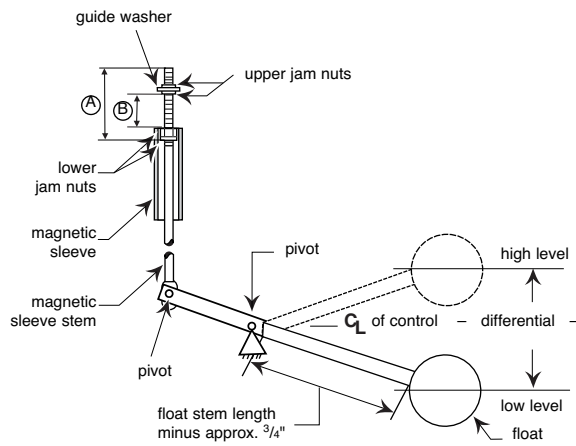


Figure 5

### Millimeters

Model <sup>①</sup>	Differentials Obtainable <sup>② ④</sup>				Approx. Jam Nut Setting <sup>③</sup>		
	Float Stem Length				A	B	
	203	305	457	660			
T62 (Threaded)	Min.	32	51	73	102	21	0.8
	Max.	148	206	294	409	33	27
T62 (Flanged)	Min.	32	41	67	95	16	0.8
	Max.	89	130	191	273	28	18

### Inches

Model <sup>①</sup>	Differentials Obtainable <sup>② ④</sup>				Approx. Jam Nut Setting <sup>③</sup>		
	Float Stem Length				A	B	
	8.00	12.00	18.00	26.00			
T62 (Threaded)	Min.	1.25	2.00	2.88	4.00	0.81	0.03
	Max.	5.81	8.12	11.56	16.12	1.31	1.06
T62 (Flanged)	Min.	1.25	1.62	2.62	3.75	0.62	0.03
	Max.	3.50	5.12	7.50	10.75	1.12	0.69

#### Notes:

- ① All models are factory set at minimum differential unless otherwise specified.
- ② To maintain maximum differential, nozzle length "L" (**figure 6**) must not exceed: 64 mm (2.50") model T62 threaded; or 89 mm (3.50") model T62 flanged.
- ③ Dimensions given are approximate and will vary slightly with each unit.
- ④ Consult factory for differentials of models not shown.

# SWITCH DIFFERENTIAL ADJUSTMENT

## LEVEL DIFFERENTIAL VS. MOUNTING NOZZLE LENGTH

The tables below may be used to determine the maximum level travel (differential) available between "Switch on" and "Switch off" actuations with mounting nozzles of different lengths. The differentials given occur with the minimum tank opening diameter listed for each model and are applicable to standard controls.

### Level differential in mm (inches)

Models	dim. "D"	Differential	dim. "L" <sup>①</sup>	Float stem length versus level differential			
				203 mm (8")	305 mm (12")	457 mm (18")	660 mm (26")
T62 threaded	77,9 mm (3.07") 3" – Sch 40	min	Not applicable	32 (1.26)	51 (2.01)	73 (2.87)	102 (4.02)
		max	50 mm (2")	148 (5.83)	206 (8.11)	294 (11.58)	409 (16.10)
			100 mm (4")	111 (4.37)	155 (6.10)	221 (8.70)	310 (12.20)
			150 mm (6")	38 (1.50)	119 (4.69)	170 (6.69)	236 (9.29)
			200 mm (8")	-	97 (3.82)	138 (5.43)	192 (7.56)
			250 mm (10")	-	81 (3.19)	116 (4.57)	162 (6.38)
305 mm (12")	-	-	100 (3.94)	138 (5.43)			
T62 flanged	73,7 mm (2.90") 3" – Sch 80	min	Not applicable	32 (1.26)	41 (1.61)	67 (2.64)	95 (3.74)
		max	50 mm (2")	89 (3.50)	130 (5.12)	191 (7.52)	273 (10.75)
			100 mm (4")	83 (3.27)	121 (4.76)	178 (7.01)	254 (10.00)
			150 mm (6")	-	95 (3.74)	137 (5.39)	197 (7.76)
			200 mm (8")	-	76 (2.99)	114 (4.49)	159 (6.26)
			250 mm (10")	-	64 (2.52)	95 (3.74)	137 (5.39)
305 mm (12")	-	-	83 (3.27)	117 (4.61)			
T64 flanged	102,3 mm (4.03") 4" – Sch 40	fixed	max 178 mm (7")	32 (1.26)	Not applicable	Not applicable	Not applicable
T67 threaded	77,9 mm (3.07") 3" – Sch 40	min	max 57 mm (2.25")	25 (1.00)	38 (1.50)	54 (2.12)	76 (3.00)
		max		64 (2.50)	95 (3.75)	140 (5.50)	197 (7.75)
T67 flanged	73,7 mm (2.90") 3" – Sch 80	min	max 89 mm (3.50")	25 (1.00)	38 (1.50)	54 (2.12)	76 (3.00)
		max		48 (1.88)	68 (2.69)	99 (3.88)	140 (5.50)

All units are factory set at minimum differential unless otherwise specified. Consult factory for differentials not shown.

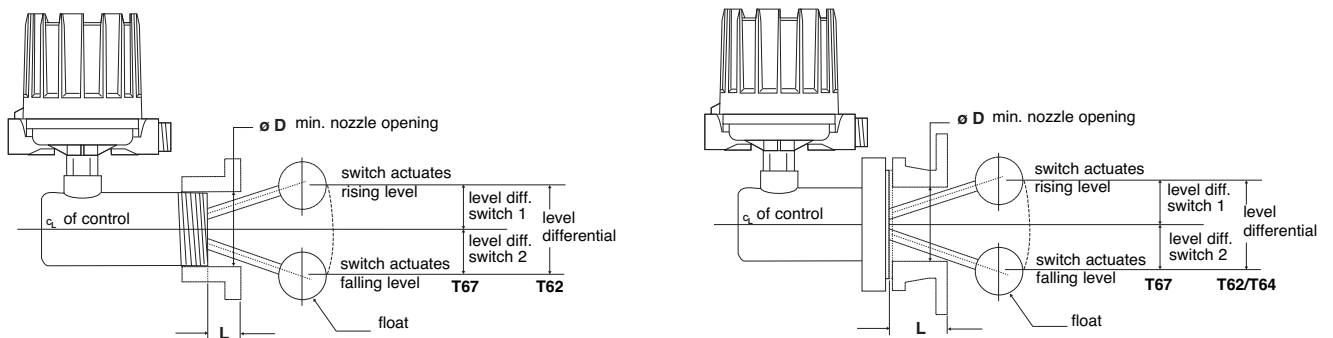


Figure 6

### Notes:

① Nozzle length is dimension L from end of standard control body to opening in tank having minimum diameter listed for each model.

## PREVENTIVE MAINTENANCE

Periodic inspections are a necessary means to keep your level control in good working order. This control is a safety device to protect the valuable equipment it serves. A systematic program of "preventive maintenance" must be implemented when the control is placed into service. If the following sections on "What to do" and "What to avoid" are observed, your control will provide reliable protection of your equipment for many years.

### What to do

#### 1. Keep control clean

Be sure the switch housing cover is always in place on the control. This cover is designed to keep dust and dirt from interfering with switch mechanism operation. In addition, it protects against damaging moisture and acts as a safety feature by keeping bare wires and terminals from being exposed. Should the housing cover become damaged or misplaced, order a replacement immediately.

#### 2. Inspect switch mechanisms, terminals and connections regularly

Dry contact switches should be inspected for excessive wear on actuating lever or misalignment of adjusting screw at point of contact between screw and lever. Such wear can cause false switch actuating levels. Adjust switch mechanism to compensate (if possible) or replace switch.

Do **NOT** operate your control with defective or maladjusted switch mechanisms (refer to bulletin on switch mechanism furnished for service instructions).

Magnetrol controls may sometimes be exposed to excessive heat or moisture. Under such conditions, insulation on electrical wires may become brittle, eventually breaking or peeling away. The resulting "bare" wires can cause short circuits.

*NOTE: Check wiring carefully and replace at the first sign of brittle insulation.*

Vibration may sometimes cause terminal screws to loosen. Check all terminal connections to be certain that screws are tight.

On units with pneumatic switches, air (or gas) lines subjected to vibration, may eventually crack or become loose at connections causing leakage. Check lines and connections carefully and repair or replace, if necessary.

*NOTE: Spare switches should be kept on hand at all times.*

#### 3. Inspect entire unit periodically

Isolate control from vessel. Raise and lower liquid level to check for switch contact and reset.

### What to avoid

1. **NEVER** leave switch housing cover of the control longer than necessary to make routine inspections.
2. **NEVER** use lubricants on pivots of switch mechanisms. A sufficient amount of lubricant has been applied at the factory to insure a lifetime of service. Further oiling is unnecessary and will only tend to attract dust and dirt which can interfere with mechanism operation.
3. **NEVER** attempt to make adjustments or replace switches without reading instructions carefully. Certain adjustments provided for in Magnetrol controls should not be attempted in the field. When in doubt, consult the factory or your local Magnetrol representative.
4. **NEVER** place a jumper wire across terminals to "cut-out" the control. If a "jumper" is necessary for test purposes, be certain it is removed before placing control into service.

## TROUBLESHOOTING

Usually the first indication of improper operation is failure of the controlled equipment to function—pump will not start (or stop), signal lamps fail to light, etc. When these symptoms occur, whether at time of installation or during routing service thereafter, check the following potential external causes first.

- Fuses may be blown.
- Reset button(s) may need resetting.
- Power switch may be open.
- Controlled equipment may be faulty.
- Stem may be bent causing hang-up.
- Wiring (or medium lines) leading to control may be defective.

If a thorough inspection of these possible conditions fails to locate the trouble, proceed next to a check of the control's switch mechanism.

### Check switch mechanism

1. Pull disconnect switch or otherwise assure that electrical circuit(s) through the control is deactivated.
2. Remove switch housing cover.
3. Disconnect power wiring from switch assembly.
4. Swing magnet assembly in and out by hand, checking carefully for any sign of binding. Assembly should require minimal force, to move it through its full swing.
5. If binding exists, magnet may be rubbing enclosing tube. If magnet is rubbing, loosen magnet clamp screw and shift magnet position. Retighten magnet clamp screw.
6. If switch magnet assembly swings freely and mechanism still fails to actuate, check installation of control to be certain it is within the specified three (3°) degrees of vertical (use spirit level on side of enclosing tube in two places, 90° apart).
7. Examine the switch closely as previously described in Preventive Maintenance section. Check continuity of switch with ohmmeter. If switch does not function properly, replace it immediately.
8. If switch mechanism is operating satisfactorily, a test of the complete control's performance is the next likely step.

### Check sensing unit

1. Check to be certain liquid is entering float chamber. A valve may be closed or piping plugged.
2. Proceed to check level sensing action by removing switch housing assembly, as described in Steps 4 through 7 of the Switch Differential Adjustment section.

#### **CAUTION:**

**Unit must be normalized to atmospheric pressure before moving switch housing assembly.**

3. Inspect attraction sleeve(s) and inside of enclosing tube for excessive corrosion or solids buildup which could restrict movement, preventing sleeve(s) from reaching field of magnet(s).
4. If the differential has been changed in the field, check tightness and position of the jam nuts.

*NOTE: Differential adjustment causes a change in the amount of level travel between switch-on and switch-off actuations. Refer to the Switch Differential Adjustment section.*

5. Vary liquid level in vessel. Check float to be certain it is buoyant in the liquid (vessel must have adequate liquid level). If float is determined to be filled with liquid or collapsed, float must be replaced. Do not attempt to repair a float.

### Check complete unit

**CAUTION: With electrical power "on" care should be taken to avoid contact with switch leads and connections at terminal block.**








Reassemble unit. Reconnect power supply and carefully actuate switch mechanism manually (using a non-conductive tool) to determine whether controlled equipment will operate.

If all components in the control are in operating condition, the trouble must be (and should be) located external to the control. Repeat inspection of external conditions previously described.

*NOTE: If difficulties are encountered which cannot be identified, consult the factory or your local representative for assistance. A complete description of the trouble should be provided along with information concerning your piping and mounting arrangement, plus a description of your operating sequence. Sketches or photographs showing the installation are also beneficial.*

*When communicating about your control, be certain always to specify the complete Model and Serial numbers.*

## AGENCY APPROVALS

AGENCY	APPROVED MODEL	AREA CLASSIFICATION
<b>ATEX</b>  	All with electric switch mechanism and housing listed as ATEX Ex d	ATEX II 2 G Ex d IIC T6 Gb
	All with electric switch mechanism and housing listed as ATEX Ex ia	ATEX II 1 G Ex ia IIC T6 Ga
<b>FM</b>  	All with electric switch mechanism and housing listed as NEMA 7/9	Class I, Div 1, groups C & D Class II, Div 1, Groups E, F & G
	Consult factory for proper model numbers	Class I, Div 1, groups B, C & D Class II, Div 1, Groups E, F & G
<b>IECEX</b>  	All with electric switch mechanism and housing listed as IECEX Ex d	Ex d IIC T6
	All with electric switch mechanism and housing listed as IECEX Ex ia	Ex ia IIC T6 Ga
<b>CSA</b>  	Consult factory for proper model numbers	Class I, Div 1, groups C & D Class II, Div 1, Groups E, F & G
	Consult factory for proper model numbers	Class I, Div 1, groups B, C & D Class II, Div 1, Groups E, F & G
<b>EAC (Russia, Kazakhstan, Belarus)</b>  	All with electric switch mechanism and housing listed as ATEX Ex d	1Ex d IIC T6 Gb
	All with electric switch mechanism and housing listed as ATEX Ex ia	0Ex ia IIC T4 Ga
<b>LRS</b>  	Lloyds Register of Shipping	Marine approval
<b>CE</b>  	The units are conform to the ATEX directive 2014/34/EU, The PED directive 2014/68/EU and the Low Voltage Directive 2014/35/EU	
Other approvals are available, consult factory for more details		

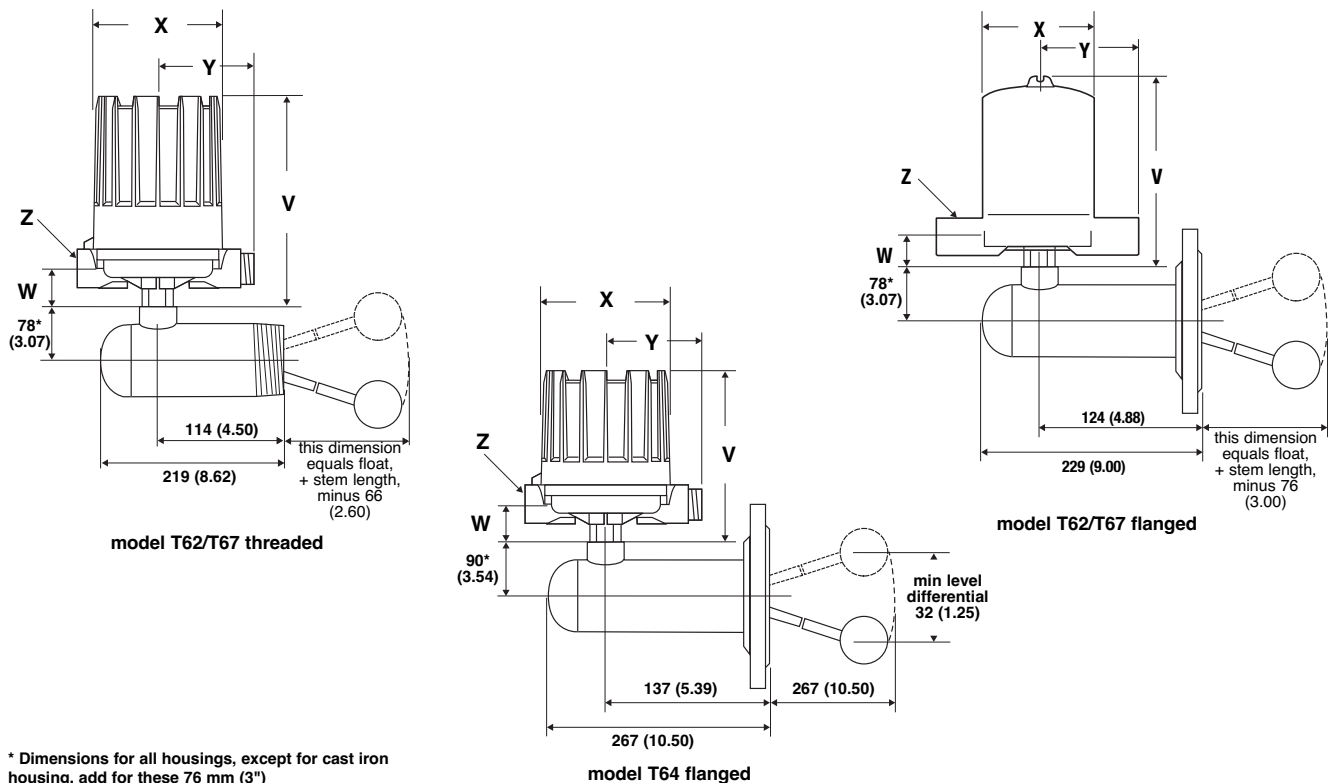


# SPECIFICATIONS

## Float pressure / temperature ratings

Model	Float size mm (inches)	Max pressure bar (psi)			
		@ 40 °C (100 °F)	@ 400 °C (750 °F)	@ 480 °C (900 °F)	@ 540 °C (1000 °F)
T62/T67	ø 64 (2.50)	24,1 (350)	19,4 (282)	18,7 (271)	18,5 (268)
	ø 64 x102 (2.50 x 4.00)	6,9 (100)	5,6 (81)	5,4 (78)	5,3 (77)
	ø 76 (3.00)	17,2 (250)	13,9 (201)	13,4 (194)	13,2 (191)
	ø 89 (3.50)	27,6 (400)	22,2 (322)	21,4 (310)	21,1 (306)
	ø 76 x 127 (3.00 x 5.00)	34,5 (500)	26,0 (377)	24,3 (353)	23,1 (335)
T64	ø 89 (3.50)	82,7 (1200)	64,5 (936)	60,4 (876)	54,7 (794)

## Dimensional data in mm (inches)



Housing type	Models	V		W		ø X		Y		Z
		mm	inches	mm	inches	mm	inches	mm	inches	
Weatherproof-FM (NEMA 7/9) - ATEX (Cast Alu)	T62/T64 with HS-switch and T67	257	10.12	42	1.66	151	5.93	109	4.29	M20 x 1,5 (*) or 1" NPT (2 entries - 1 plugged) (*) not for FM (NEMA 7/9)
	T62/T64 excl. HS-switch	202	7.94							
ATEX (Cast Iron)	All	249	9.80	45	1.77	143	5.63	110	4.33	M20 x 1,5 or 3/4" NPT (single entry - 2 entries at request)
Pneumatics Switch Module J	T62/T64	165	6.50	39	1.54	118	4.65	110	4.33	1/4" NPT
Pneumatics Switch Module K								130	5.12	

Allow 200 mm (7.87") overhead clearance / All housings are 360 ° rotatable

# REPLACEMENT PARTS

Partn°:

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Serial n°:

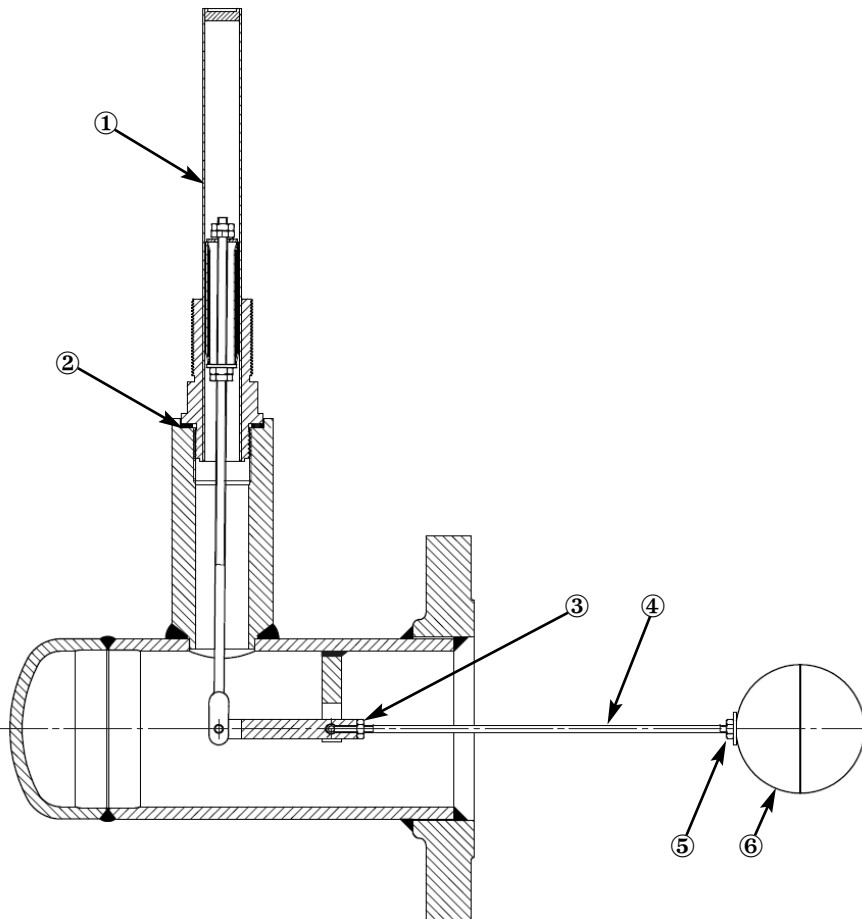
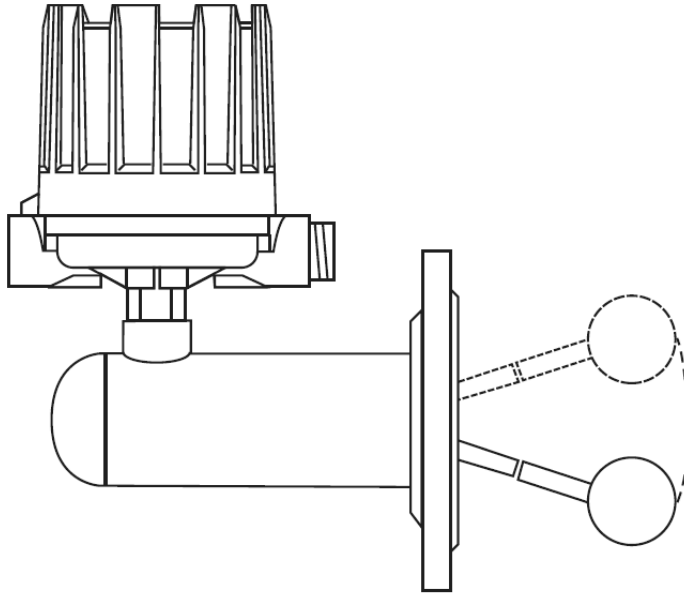
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Digit in partn°:

X	1	2	3	4	5	6	7	8	9	10
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See nameplate, always provide complete partn° and serial n° when ordering spares.

→ X = product with a specific customer requirement



## REPLACEMENT PARTS

### Switch and housing reference

Switch type	Bulletin
B, C, D, F, R, U, W, X, 8, 9	BE 42-683
HS	BE 42-694
V	BE 42-798
J	BE 42-685
K	BE 42-686
Housing	BE 42-683

### (1) Enclosing tube kit (contains items 1 & 2)

Housing type	Replacement part		
	Model (digits 1, 2 & 3)		
	T62	T64	T67
Cast aluminium housing for electric switch	089-5933-021	089-5933-027	089-5933-022
Cast iron housing for electric switch	089-5933-023	089-5933-029	089-5933-023
Pneumatic switch housing	089-5933-021	089-5933-027	not applicable

Description	Replacement part		
	Model (digits 1, 2 & 3)		
	T62	T64	T67
(2) Enclosing tube gasket	012-1301-002	012-1204-001	012-1301-002
(3) Hex nut	010-2107-001	010-2107-003	010-2107-001
(5) Hex nut	010-2107-001	010-2107-003	010-2107-001

### (4) Float stem

Digit 7	Replacement part		
	Model (digits 1, 2 & 3)		
	T62	T64	T67
A, E, J, S	004-5004-009	not applicable	004-5004-009
N		004-5170-080	
B, F, K, P, T	004-5004-006	not applicable	004-5004-006
C, G, L, Q, V	004-5004-007		004-5004-007
D, H, M, R, W	004-5004-008		004-5004-008

### (6) Float

Digit 7	Replacement part		
	Model (digits 1, 2 & 3)		
	T62	T64	T67
A, B, C, D	Z07-1102-001	not applicable	Z07-1102-001
E, F, G, H	Z07-1202-001		Z07-1202-001
J, K, L, M	Z07-1102-004		Z07-1102-004
N	Z07-1102-006	Z07-1101-012	Z07-1102-006
P, Q, R		not applicable	Z07-1202-003
S, T, V, W	Z07-1202-003		

# SELECTION DATA T62/T64 SINGLE SWITCH

A complete measuring system consists of:

Order code for **T62** models:

## MODEL NUMBER CODE AND MATERIALS OF CONSTRUCTION

Model No.	Set points	Cage & process connection	Float and trim	Magnetic sleeve
T62-A	1	Carbon steel	316 SST (1.4401)	400 series SST
T62-B				316 SST (1.4401)
T62-D		316/316L SST (1.4401/1.4404)		

PROCESS CONNECTION  
– threaded

F 2	3" NPT
-----	--------

– ASME flanges

G 3	3" 150 lbs ASME RF
G 4	3" 300 lbs ASME RF
H 3	4" 150 lbs ASME RF
H 4	4" 300 lbs ASME RF

– EN flanges

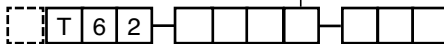
7 F	DN 80, PN 16	EN 1092-1 Type B1
7 G	DN 80, PN 25/40	EN 1092-1 Type B1
8 F	DN 100, PN 16	EN 1092-1 Type B1
8 G	DN 100, PN 25/40	EN 1092-1 Type B1

FLOAT AND STEM LENGTH

Stem length versus min S.G.					Float size mm (inches) ①	Max pressure bar (psi)	
203 mm (8")	305 mm (12")	457 mm (18")	660 mm (26")			@ 40 °C (100 °F)	@ 540 °C (1000 °F)
A 0,80	B 0,80	C 0,90	D 0,90		ø 64 (2.50)	24,1 (350)	18,5 (268)
E 0,52	F 0,55	G 0,60	H 0,66		ø 64 x 102 (2.50 x 4.00)	6,9 (100)	5,3 (77)
J 0,55	K 0,55	L 0,60	M 0,60		ø 76 (3.00)	17,2 (250)	13,2 (191)
N 0,50	P 0,50	Q 0,55	R 0,55		ø 89 (3.50)	27,6 (400)	21,1 (306)
S 0,65	T 0,65	V 0,70	W 0,70		ø 76 x 127 (3.00 x 5.00)	34,5 (500)	23,1 (335)

① All floats can be screwed to float stem from inside of vessel in case the float cannot pass through the nozzle.

SWITCH MECHANISM & HOUSING (next page)



complete code for **T62** models

X = product with a specific customer requirement

Order code for **T64** models:

## MODEL NUMBER CODE AND MATERIALS OF CONSTRUCTION

Model No.	Set points	Cage & process connection	Float and trim	Magnetic sleeve
T64-A	1	Carbon steel	304 SST (1.4301) / 316 SST (1.4401)	400 series SST
T64-B				316 SST (1.4401)

PROCESS CONNECTION  
– ASME flanges

H 3	4" 150 lbs ASME RF
H 4	4" 300 lbs ASME RF
H 5	4" 600 lbs ASME RF

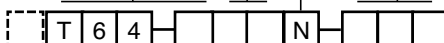
– EN flanges

8 F	DN 100, PN 16	EN 1092-1 Type B1
8 G	DN 100, PN 25/40	EN 1092-1 Type B1
8 H	DN 100, PN 63	EN 1092-1 Type B2
8 J	DN 100, PN 100	EN 1092-1 Type B2

FLOAT AND STEM LENGTH

N	Fixed stem length: 203 mm (8") Min. S.G: 0,40 Float size: ø 89 mm (3.50") Float rating: 82,7 bar (1200 psi) @ 40 °C (100 °F) 54,7 bar (794 psi) @ 540 °C (1000 °F)
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SWITCH MECHANISM & HOUSING (next page)



complete code for **T64** models

X = product with a specific customer requirement

## SELECT ELECTRIC SWITCH MECHANISM & HOUSING

Switch Description	Process ① Temperature Range °C (°F)	Contacts	T62-A & T64-A Models									T62-B, T62-D & T64-B Models								
			Weather proof (IP 66)	ATEX - IECEx (IP 66)						FM (IP 66) NEMA 7/9	Weather proof (IP 66)	ATEX - IECEx (IP 66)						FM (IP 66) NEMA 7/9		
				II 2G Ex d IIC T6 Gb			II 1G Ex ia IIC T6 Ga					II 2G Ex d IIC T6 Gb			II 1G Ex ia IIC T6 Ga					
				Cast Aluminium		Cast Iron (ATEX only)	Cast Aluminium		Cast Alu.			Cast Aluminium		Cast Iron (ATEX only)	Cast Aluminium		Cast Alu.			
			M20x1,5	1" NPT	M20x1,5	1" NPT	M20x1,5	3/4" NPT	M20x1,5	1" NPT	1" NPT	M20x1,5	1" NPT	M20x1,5	1" NPT	M20x1,5	3/4" NPT	M20x1,5	1" NPT	1" NPT
Series B Snap switch	-40 to +120 (-40 to +250)	1x SPDT	B2P	BAP	BHC	BAC	BK7	BU7	–	–	BKP	B2Q	BAQ	BH9	BA9	BK5	BU5	–	–	BKQ
		1x DPDT	B8P	BDP	BJC	BBC	BD7	BW7	–	–	BNP	B8Q	BDQ	BJ9	BB9	BD5	BW5	–	–	BNQ
Series C Snap switch	-40 to +230 (-40 to +450)	1x SPDT	C2P	CAP	CHC	CAC	CK7	CU7	C2L	CAL	CKP	C2Q	CAQ	CH9	CA9	CK5	CU5	C2S	CAS	CKQ
		1x DPDT	C8P	CDP	CJC	CBC	CD7	CW7	C8L	CDL	CNP	C8Q	CDQ	CJ9	CB9	CD5	CW5	C8S	CDS	CNQ
Series D DC Current Snap switch	-40 to +120 (-40 to +250)	1x SPDT	–	–	–	–	–	–	–	–	–	D2Q	DAQ	DH9	DA9	DK5	DU5	–	–	DKQ
		1x DPDT	–	–	–	–	–	–	–	–	–	D8Q	DDQ	DJ9	DB9	DD5	DW5	–	–	DNQ
Series F Hermetically sealed Snap switch	-45 to +400 (-50 to +750)	1x SPDT	F2P	FAP	FHC	FAC	FK7	FU7	–	–	FKP	F2Q	FAQ	FH9	FA9	FK5	FU5	–	–	FKQ
		1x DPDT	F8P	FDP	FJC	FBC	FD7	FW7	–	–	FNP	F8Q	FDQ	FJ9	FB9	FD5	FW5	–	–	FNQ
Series HS Hermetically sealed Snap switch	-45 to +290 ② (-50 to +550)	1x SPDT	–	–	–	–	–	–	–	–	–	H7A	HM2	HFC	HA9	HB3	HB4	–	–	HM3
		1x DPDT	–	–	–	–	–	–	–	–	–	H7C	HM6	HGC	HB9	HB7	HB8	–	–	HM7
Series U Gold alloy contacts Snap switch	-40 to +120 (-40 to +250)	1x SPDT	U2P	UAP	UHC	UAC	UK7	UU7	U2L	UAL	UKP	U2Q	UAQ	UH9	UA9	UK5	UU5	U2S	UAS	UKQ
		1x DPDT	U8P	UDP	UJC	UBC	UD7	UW7	U8L	UDL	UNP	U8Q	UDQ	UJ9	UB9	UD5	UW5	U8S	UDS	UNQ
Series V Inductive Proximity switch	-40 to +100 (-40 to +210)	–	–	–	–	–	–	VFS	VHS	–	–	–	–	–	–	–	–	V5S	VBS	–
Series W Hermetically sealed Silver plated contacts Snap switch	-45 to +230 (-50 to +450)	1x SPDT	W2P	WAP	WHC	WAC	WK7	WU7	W2L	WAL	WKP	W2Q	WAQ	WH9	WA9	WK5	WU5	W2S	WAS	WKQ
		1x DPDT	–	–	–	–	–	–	–	–	–	W8Q	WDQ	WJ9	WB9	WD5	WW5	W8S	WDS	WNQ
Series X Hermetically sealed Gold plated contacts Snap switch	-45 to +230 (-50 to +450)	1x SPDT	X2P	XAP	XHC	XAC	XK7	XU7	X2L	XAL	XKP	X2Q	XAQ	XH9	XA9	XK5	XU5	X2S	XAS	XKQ
		1x DPDT	–	–	–	–	–	–	–	–	–	X8Q	XDQ	XJ9	XB9	XD5	XW5	X8S	XDS	XNQ
Series R High temperature Snap switch	-40 to +400 (-40 to +750)	1x SPDT	–	–	–	–	–	–	–	–	–	R2Q	R1Q	RH9	RA9	RK5	RU5	–	–	RKQ
		1x DPDT	–	–	–	–	–	–	–	–	–	R8Q	RDQ	RJ9	RB9	RN5	RF5	–	–	RNQ
Series 8 Hermetically sealed Snap switch	-45 to +400 (-50 to +750)	1x SPDT	82P	8AP	8HC	8AC	8K7	8U7	–	–	8KP	82Q	8AQ	8H9	8A9	8K5	8U5	–	–	8KQ
		1x DPDT	88P	8DP	8JC	8BC	8D7	8W7	–	–	8NP	88Q	8DQ	8J9	8B9	8D5	8W5	–	–	8NQ
Series 9 High temperature Hermetically sealed Snap switch	-45 to +400 (-50 to +750)	1x SPDT	92P	9AP	9HC	9AC	9K7	9U7	–	–	9KP	92Q	9AQ	9H9	9A9	9K5	9U5	–	–	9KQ
		1x DPDT	98P	9DP	9JC	9BC	9D7	9W7	–	–	9NP	98Q	9DQ	9J9	9B9	9D5	9W5	–	–	9NQ
Switch Description	Process ① Temperature Range °C (°F)	Contacts	Weather proof (IP 65)	ATEX (IP 66)						Weather proof (IP 65)	ATEX (IP 66)									
				II 2G Ex d IIC T6 Gb							II 2G Ex d IIC T6 Gb									
				CS/Aluminium			Cast Iron				CS/Aluminium			Cast Iron						
				3/4" NPT			M20x1,5				3/4" NPT			3/4" NPT			M20x1,5			
Series R High temperature Snap switch	-40 to +540 ③ (-40 to +1000)	1x SPDT	–	–	–	–	–	–	–	R1Y	–	–	–	–	–	–	–	–	–	–
		1x DPDT	–	–	–	–	–	–	–	–	RDY	–	–	–	–	–	–	–	–	–
Series 9 High temperature Hermetically sealed Snap switch	-40 to +540 ③ (-40 to +1000)	1x SPDT	–	–	–	–	–	–	–	–	9AY	–	–	–	–	–	–	–	–	–
		1x DPDT	–	–	–	–	–	–	–	–	9DY	–	–	–	–	–	–	–	–	–

## SELECT PNEUMATIC SWITCH MECHANISM & HOUSING

Switch Description	Max supply pressure bar (psi)	Max liquid temperature °C (°F)	Bleed orifice Ø mm (inches)	NEMA 3R (IP 53)	
				T62-A & T64-A Models	T62-B, T62-D & T64-B Models
Series J (open air)	6,9 (100)	200 (400)	1,60 (0.063)	JDG	JDE
	4,1 (60)		2,39 (0.094)	JEG	JEE
	4,1 (60)	370 (700)	1,40 (0.055)	JFG	JFE
Series K (closed circuit)	6,9 (100)	200 (400)	–	–	KOE
	2,8 (40)		–	KOG	–

① Process temperature based on max. 40 °C (100 °F) ambient temperature and for non steam applications.

② On steam applications, temperature down-rated to +200 °C (+400 °F) process at +40 °C (+100 °F) ambient.

③ Upon prolonged exposure to temperatures above 425 °C (800 °F), the carbide phase of steel may be converted to graphite. Permissible but not recommended for prolonged use above 425 °C (800 °F). (Applies to models T62-A & T62-B, T64-A & T64-B.)

# SELECTION DATA T67 DUAL SWITCH

A complete measuring system consists of:

Order code for T67 models:

## MODEL NUMBER CODE AND MATERIALS OF CONSTRUCTION

Model No.	Set points	Cage & process connection	Float and trim	Magnetic sleeve
T67-A	2	Carbon steel	316 SST (1.4401)	400 series SST
T67-B				316 SST (1.4401)
T67-D		316/316L SST (1.4401/1.4404)		316 SST (1.4401)

PROCESS CONNECTION  
– threaded

F 2	3" NPT
-----	--------

– ASME flanges

G 3	3" 150 lbs ASME RF
G 4	3" 300 lbs ASME RF
H 3	4" 150 lbs ASME RF
H 4	4" 300 lbs ASME RF

– EN flanges

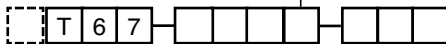
7 F	DN 80, PN 16	EN 1092-1 Type B1
7 G	DN 80, PN 25/40	EN 1092-1 Type B1
8 F	DN 100, PN 16	EN 1092-1 Type B1
8 G	DN 100, PN 25/40	EN 1092-1 Type B1

## FLOAT AND STEM LENGTH

Stem length versus min S.G.						Float size mm (inches) <sup>①</sup>	Max pressure bar (psi)			
203 mm (8")		305 mm (12")		457 mm (18")			660 mm (26")		@ 40 °C (100 °F)	@ 540 °C (1000 °F)
A	0,80	B	0,80	C	0,90	D	0,90	∅ 64 (2.50)	24,1 (350)	18,5 (268)
E	0,52	F	0,55	G	0,60	H	0,66	∅ 64 x 102 (2.50 x 4.00)	6,9 (100)	5,3 (77)
J	0,55	K	0,55	L	0,60	M	0,60	∅ 76 (3.00)	17,2 (250)	13,2 (191)
N	0,50	P	0,50	Q	0,55	R	0,55	∅ 89 (3.50)	27,6 (400)	21,1 (306)
S	0,65	T	0,65	V	0,70	W	0,70	∅ 76 x 127 (3.00 x 5.00)	34,5 (500)	23,1 (335)

<sup>①</sup> All floats can be screwed to float stem from inside of vessel in case the float cannot pass through the nozzle.

SWITCH MECHANISM & HOUSING (next page)



complete code for T67 models

X = product with a specific customer requirement

# SELECT ELECTRIC SWITCH MECHANISM & HOUSING

Switch Description	Process <sup>①</sup> Temperature Range °C (°F)	Contacts	T67-A Models									T67-B & T67-D Models								
			Weather proof (IP 66)	ATEX - IECEx (IP 66)						FM (IP 66) NEMA 7/9	Weather proof (IP 66)	ATEX - IECEx (IP 66)						FM (IP 66) NEMA 7/9		
				II 2G Ex d IIC T6 Gb			II 1G Ex ia IIC T6 Ga					II 2G Ex d IIC T6 Gb			II 1G Ex ia IIC T6 Ga					
			Cast Aluminium		Cast Aluminium		Cast Iron (ATEX only)		Cast Aluminium		Cast Alu.	Cast Aluminium		Cast Aluminium		Cast Iron (ATEX only)		Cast Aluminium		Cast Alu.
			M20x1.5	1" NPT	M20x1.5	1" NPT	M20x1.5	3/4" NPT	M20x1.5	1" NPT	1" NPT	M20x1.5	1" NPT	M20x1.5	1" NPT	M20x1.5	3/4" NPT	M20x1.5	1" NPT	1" NPT
Series B Snap switch	-40 to +120 (-40 to +250)	2x SPDT	B4A	BBA	BLC	BDC	BL7	BV7	–	–	BLA	B4B	BBB	BL9	BD9	BL5	BV5	–	–	BLB
		2x DPDT	B1A	BEA	BPC	BGC	BO7	BY7	–	–	BOA	B1B	BEB	BP9	BG9	BO5	BY5	–	–	BOB
Series C Snap switch	-40 to +230 (-40 to +450)	2x SPDT	C4A	CBA	CLC	CDC	CL7	CV7	C4X	CBX	CLA	C4B	CBB	CL9	CD9	CL5	CV5	C4T	CBT	CLB
		2x DPDT	C1A	CEA	CPC	CGC	CO7	CY7	C1X	CEX	COA	C1B	CEB	CP9	CG9	CO5	CY5	C1T	CET	COB
Series D DC Current Snap switch	-40 to +120 (-40 to +250)	2x SPDT	–	–	–	–	–	–	–	–	–	D4B	DBB	DL9	DD9	DL5	DV5	–	–	DLB
		2x DPDT	–	–	–	–	–	–	–	–	–	D1B	DEB	DP9	DG9	DO5	DY5	–	–	DOB
Series F Hermetically sealed Snap switch	-45 to +400 (-50 to +750)	2x SPDT	FFA	FBA	FLC	FDC	FL7	FV7	–	–	FLA	FFB	FBB	FL9	FD9	FL5	FV5	–	–	FLB
		2x DPDT	FHA	FEA	FPC	FGC	FO7	FY7	–	–	FOA	FHB	FEB	FP9	FG9	FO5	FY5	–	–	FOB
Series U Gold alloy contacts Snap switch	-40 to +120 (-40 to +250)	2x SPDT	U4A	UBA	ULC	UDC	UL7	UV7	U4X	UBX	ULA	U4B	UBB	UL9	UD9	UL5	UV5	U4T	UBT	ULB
		2x DPDT	U1A	UEA	UPC	UGC	UO7	UY7	U1X	UEX	UOA	U1B	UEB	UP9	UG9	UO5	UY5	U1T	UET	UOB
Series W Hermetically sealed Silver plated contacts Snap switch	-45 to +230 (-50 to +450)	2x SPDT	W4A	WBA	WLC	WDC	WL7	WV7	W4X	WBX	WLA	W4B	WBB	WL9	WD9	WL5	WV5	W4T	WBT	WLB
		2x DPDT	W1B	WEB	WP9	WG9	WO5	WY5	W1T	WET	WOB	W1B	WEB	WP9	WG9	WO5	WY5	W1T	WET	WOB
Series X Hermetically sealed Gold plated contacts Snap switch	-45 to +230 (-50 to +450)	2x SPDT	X4A	XBA	XLC	XDC	XL7	XV7	X4X	XBX	XLA	X4B	XBB	XL9	XD9	XL5	XV5	X4T	XBT	XLB
		2x DPDT	X1B	XEB	XP9	XG9	XO5	XY5	X1T	XET	XOB	X1B	XEB	XP9	XG9	XO5	XY5	X1T	XET	XOB
Series R High temperature Snap switch	-40 to +400 (-40 to +750)	2x SPDT	R4B	R3B	RL9	RD9	RL5	RV5	–	–	RLB	R4B	R3B	RL9	RD9	RL5	RV5	–	–	RLB
		2x DPDT	RHB	REB	RP9	RG9	RO5	RG5	–	–	ROB	RHB	REB	RP9	RG9	RO5	RG5	–	–	ROB
Series 8 Hermetically sealed Snap switch	-45 to +400 (-50 to +750)	2x SPDT	84A	8BA	8LC	8DC	8L7	8V7	–	–	8LA	84B	8BB	8L9	8D9	8L5	8V5	–	–	8LB
		2x DPDT	81A	8EA	8PC	8GC	8O7	8Y7	–	–	8OA	81B	8EB	8P9	8G9	8O5	8Y5	–	–	8OB
Series 9 High temperature Hermetically sealed Snap switch	-45 to +400 (-50 to +750)	2x SPDT	94A	9BA	9LC	9DC	9L7	9V7	–	–	9LA	94B	9BB	9L9	9D9	9L5	9V5	–	–	9LB
		2x DPDT	91A	9EA	9PC	9GC	9O7	9Y7	–	–	9OA	91B	9EB	9P9	9G9	9O5	9Y5	–	–	9OB
Switch Description	Process <sup>①</sup> Temperature Range °C (°F)	Contacts	Weather proof (IP 65)	ATEX (IP 66)						Weather proof (IP 65)	ATEX (IP 66)									
				II 2G Ex d IIC T6 Gb							II 2G Ex d IIC T6 Gb									
			CS/Aluminium			Cast Iron			CS/Aluminium			Cast Iron								
			3/4" NPT		M20x1.5		3/4" NPT		3/4" NPT		M20x1.5		3/4" NPT							
Series R High temperature Snap switch	-40 to +540 <sup>②</sup> (-40 to +1000)	2x SPDT	R3M		RL5		RV5		R3M		RL5		RV5							
		2x DPDT	REM		RO5		RG5		REM		RO5		RG5							
Series 9 High temperature Hermetically sealed Snap switch	-40 to +540 <sup>②</sup> (-40 to +1000)	2x SPDT	9BD		9L7		9V7		9BM		9L5		9V5							
		2x DPDT	9ED		9O7		9Y7		9EM		9O5		9Y5							

<sup>①</sup> Process temperature based on max. 40 °C (100 °F) ambient temperature and for non steam applications.

<sup>②</sup> Upon prolonged exposure to temperatures above 425 °C (800 °F), the carbide phase of steel may be converted to graphite. Permissible but not recommended for prolonged use above 425 °C (800 °F). (Applies to models T67-A & T67-B.)

# IMPORTANT

## SERVICE POLICY

Owners of Magnetrol products may request the return of a control; or, any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Magnetrol International will repair or replace the control, at no cost to the purchaser, (or owner) **other than transportation cost** if:

- a. Returned within the warranty period; and,
- b. The factory inspection finds the cause of the malfunction to be defective material or workmanship.

If the trouble is the result of conditions beyond our control; or, is **NOT** covered by the warranty, there will be charges for labour and the parts required to rebuild or replace the equipment.

In some cases, it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned, will be determined on the basis of the applicability of our warranty.

No claims for misapplication, labour, direct or consequential damage will be allowed.

## RETURNED MATERIAL PROCEDURE

So that we may efficiently process any materials that are returned, it is essential that a "Return Material Authorisation" (RMA) form will be obtained from the factory. It is mandatory that this form will be attached to each material returned. This form is available through Magnetrol's local representative or by contacting the factory. Please supply the following information:

1. Purchaser Name
2. Description of Material
3. Serial Number and Ref Number
4. Desired Action
5. Reason for Return
6. Process details

Any unit that was used in a process must be properly cleaned in accordance with the proper health and safety standards applicable by the owner, before it is returned to the factory.

A material Safety Data Sheet (MSDS) must be attached at the outside of the transport crate or box.

All shipments returned to the factory must be by prepaid transportation. Magnetrol **will not accept** collect shipments.

All replacements will be shipped Ex Works.

UNDER RESERVE OF MODIFICATIONS

BULLETIN: BE 44-602.14  
EFFECTIVE: FEBRUARY 2020  
SUPERSEDES: October 2019

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