

B24 & C24

Liquid Float Level Switches

DESCRIPTION

Magnetrol's series 24 liquid level switches are single switch mechanism units available for level alarm or shut down applications. The B24 is designed for service in steam boilers up to 250 lbs WSP. The C24 is designed for general industrial use.

FEATURES

- Cast iron float cage
- Process temperature up to 200 °C (400 °F)
- Removable sensing unit from cage allows easy maintenance
- Single switch level
- Specific gravity as low as 0,85
- Process pressure up to 27,6 bar (400 psi)
- Standard anti corrosive protection
- Materials of construction:
 - cage: cast iron
 - float and trim: 316 SST (1.4401)
 - magnetic sleeve: 400 series SST
- Process connection: 1" NPT-F side/bottom

APPLICATIONS

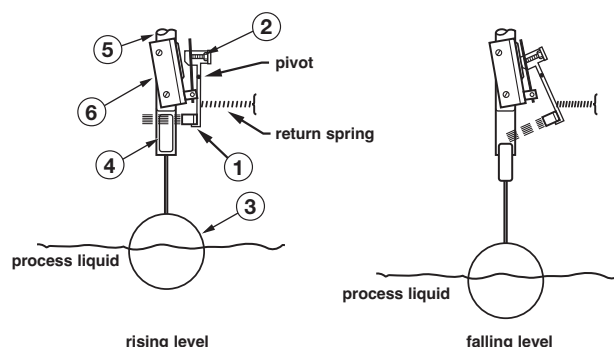
- Boilers
- Condensate receivers
- Flash tanks
- Holding tanks
- Day tanks
- Dump valve controls

Standard cast iron cages









PRINCIPLE OF OPERATION

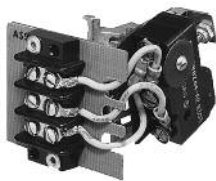
A permanent magnet ① is attached to a pivoted switch actuator and adjustment screw ②. As the float ③ rises following the liquid level, it raises the attraction sleeve ④ into the field of the magnet, which then snaps against the non-magnetic enclosing tube ⑤, actuating the switch ⑥. The enclosing tube provides a static pressure boundary between the switch mechanism and the process. On a falling level, an inconel spring retracts the magnet, deactivating the switch.



AGENCY APPROVALS

AGENCY		APPROVED MODEL	AREA CLASSIFICATION
ATEX		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
FM		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
IECEX		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
CSA		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
EAC (Russia, Kazakhstan, Belarus)		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
CE		The units are conform to the ATEX directive 2014/34/EU, PED directive 2014/68/EU, Low Voltage Directive 2014/35/EU and RoHS directive 2011/65/EU	
Other approvals are available, consult factory for more details			

SWITCH MECHANISMS AND HOUSINGS



Series B, C, F, U, W & X Dry contact switches ^①

- Series B and C switches are general purpose units with a selection of maximum liquid temperature ratings
- Series U switches have gold alloy contacts
- Series F, W and X switches are hermetically sealed



Series V Inductive Proximity switch ^③

- Series V switches are inductive proximity switches type SJ3,5-SN with a maximum liquid temperature rating of +100 °C (+210 °F)

Basic electrical ratings ^①

Voltage	Switch Series and Non-Inductive Ampere Rating					
	B	C	F	U	W	X
120 V AC	15.00	15.00	2.50	1.00	1.00	0.50
240 V AC	15.00	15.00	—	—	1.00	0.50
24 V DC	6.00	6.00	4.00	1.00	3.00	0.50
120 V DC	0.50	1.00	0.30	—	0.50	0.50
240 V DC	0.25	0.50	—	—	—	—



Series J & K Pneumatic switches ^②

- Suited for process industry applications in hazardous locations or where electrical power is not available
- Series J bleed type switch is intended for general purpose applications
- Series K switch is specially designed to provide non-bleed operation with a high degree of vibration resistance



Switch housings ^①

- Die cast aluminium housings
- Cast iron housings
- Optional housing heaters and drains available for some housings
- Pneumatic switch mechanisms available with alu base/cold rolled steel cover

^① For more details see bulletin BE 42-683

^② For more details on J & K Pneumatic switches, see bulletin BE 42-685 and bulletin BE 42-686

^③ For more details on V Inductive Proximity switches, see bulletin BE 42-798

EXPEDITE SHIP PLAN (ESP)

Several models are available for quick shipment, within max. 4 weeks after factory receipt of purchase order, through the Expedite Ship Plan (ESP). To take advantage of ESP, simply match the blue model number codes.

ESP delivery is limited to a maximum of 10 units per order. Contact your local representative for lead times on larger volume orders, as well as other products and options.

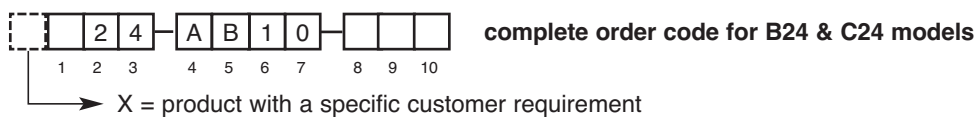
SELECTION DATA

Order code for liquid level switch, consists of 1 order code:

1 - 7 | BASIC MODEL NUMBER, SPECIFIC GRAVITY AND PRESSURE LIMITS

Model No.	Cage type	Min. S.G.	Process temp. °C (°F)	Max. pressure bar (psi)
B24-AB10	Cast iron cage with self-cleaning brass liner for steam boiler applications	0,85	40 (100) 200 (400)	27,6 (400) 17,2 (250)
C24-AB10	Cast iron cage for general industrial applications	0,85	40 (100) 200 (400)	27,6 (400) 17,2 (250)

8 - 10 | SWITCH MECHANISM & HOUSING (see below)



SELECT ELECTRIC SWITCH MECHANISM & HOUSING

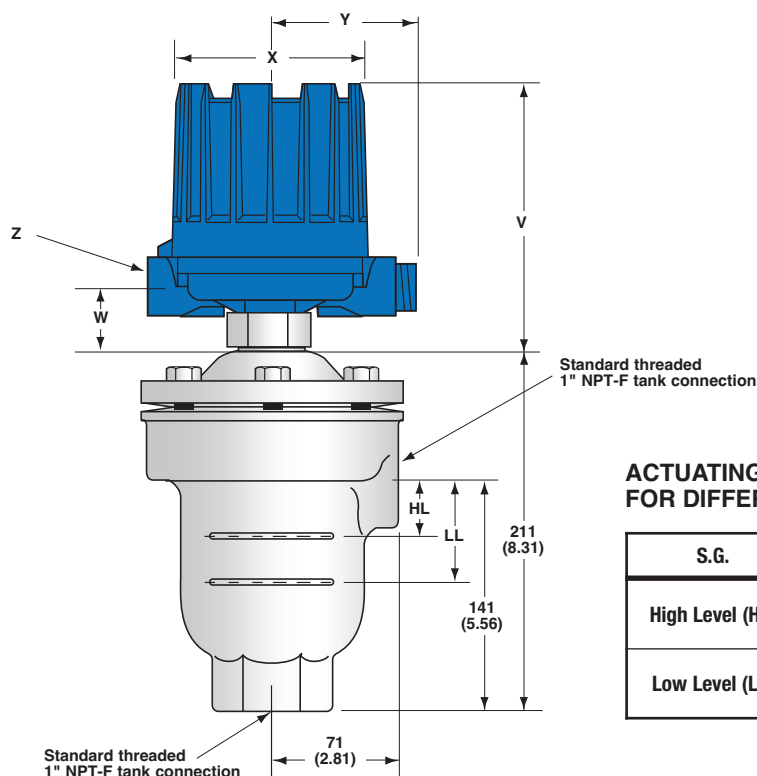
Switch Description	Process Temperature Range °C (°F)	Contacts	Weather proof (IP 66)		ATEX - IECEx (IP 66)						FM (IP 66)
					II 2G Ex d IIC T6 Gb				II 1G Ex ia IIC T6 Ga		NEMA 7/9
			Cast Aluminium		Cast Aluminium	Cast Iron (ATEX only)			Cast Aluminium		Cast Alu.
			M20x1,5	1" NPT	M20x1,5	1" NPT	M20x1,5	3/4" NPT	M20x1,5	1" NPT	1" NPT
Series B Snap switch	-40 to +120 (-40 to +250)	1x SPDT	B2P	BAP	BHC	BAC	BK7	BU7	—	—	BKP
		1x DPDT	B8P	BDP	BJC	BBC	BD7	BW7	—	—	BNP
Series C Snap switch	-40 to +200 (-40 to +400)	1x SPDT	C2P	CAP	CHC	CAC	CK7	CU7	C2L	CAL	CKP
		1x DPDT	C8P	CDP	CJC	CBC	CD7	CW7	C8L	CDL	CNP
Series F Hermetically sealed Snap switch	-45 to +200 (-50 to +400)	1x SPDT	F2P	FAP	FHC	FAC	FK7	FU7	—	—	FKP
		1x DPDT	F8P	FDP	FJC	FBC	FD7	FW7	—	—	FNP
Series U Gold alloy contacts Snap switch	-40 to +120 (-40 to +250)	1x SPDT	U2P	UAP	UHC	UAC	UK7	UU7	U2L	UAL	UKP
		1x DPDT	U8P	UDP	UJC	UBC	UD7	UW7	U8L	UDL	UNP
Series V Inductive Proximity switch	-40 to +100 (-40 to +210)	—	—	—	—	—	—	—	VFS	VHS	—
Series W Hermetically sealed Silver plated contacts Snap switch	-45 to +200 (-50 to +400)	1x SPDT	W2P	WAP	WHC	WAC	WK7	WU7	W2L	WAL	WKP
		1x DPDT	—	—	—	—	—	—	—	—	—
Series X Hermetically sealed Gold plated contacts Snap switch	-45 to +200 (-50 to +400)	1x SPDT	X2P	XAP	XHC	XAC	XK7	XU7	X2L	XAL	XKP
		1x DPDT	—	—	—	—	—	—	—	—	—

SELECT PNEUMATIC SWITCH MECHANISM & HOUSING

Switch Description	Max. supply pressure bar (psi)	Max. process temperature ^① °C (°F)	Bleed orifice Ø mm (inches)	NEMA 3R (IP 53)
Series J (open air)	4,1 (60)	200 (400)	2,39 (0.094)	JEG
Series K (closed circuit)	2,8 (40)	200 (400)	—	KOG

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

DIMENSIONS in mm (inches)



ACTUATING LEVELS IN mm (inches) FOR DIFFERENT SPECIFIC GRAVITIES

S.G.	0,85	0,90	0,95	1,00	1,05	1,10
High Level (HL)	18 (0.71)	20 (0.79)	22 (0.87)	24 (0.94)	25 (0.98)	27 (1.06)
Low Level (LL)	40 (1.57)	41 (1.61)	42 (1.65)	43 (1.69)	44 (1.73)	45 (1.77)

Housing type	V		W		ø X		Y		Z
	mm	inches	mm	inches	mm	inches	mm	inches	
Weatherproof - FM (NEMA 7/9) - ATEX (Cast Alu)	202	7.94	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)
ATEX (Cast Iron)	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	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



QUALITY ASSURANCE - ISO 9001

THE QUALITY ASSURANCE SYSTEM IN PLACE AT MAGNETROL GUARANTEES THE HIGHEST LEVEL OF QUALITY DURING THE DESIGN, THE CONSTRUCTION AND THE SERVICE OF CONTROLS. OUR QUALITY ASSURANCE SYSTEM IS APPROVED AND CERTIFIED TO ISO 9001 AND OUR TOTAL COMPANY IS COMMITTED TO PROVIDING FULL CUSTOMER SATISFACTION BOTH IN QUALITY PRODUCTS AND QUALITY SERVICE.

PRODUCT WARRANTY

ALL MAGNETROL MECHANICAL LEVEL CONTROLS ARE WARRANTED FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP FOR 3 FULL YEARS FROM THE DATE OF ORIGINAL FACTORY SHIPMENT.

IF RETURNED WITHIN THE WARRANTY PERIOD; AND, UPON FACTORY INSPECTION OF THE CONTROL, THE CAUSE OF THE CLAIM IS DETERMINED TO BE COVERED UNDER THE WARRANTY; THEN, MAGNETROL INTERNATIONAL WILL REPAIR OR REPLACE THE CONTROL AT NO COST TO THE PURCHASER (OR OWNER) OTHER THAN TRANSPORTATION.

MAGNETROL SHALL NOT BE LIABLE FOR MISAPPLICATION, LABOR CLAIMS, DIRECT OR CONSEQUENTIAL DAMAGE OR EXPENSE ARISING FROM THE INSTALLATION OR USE OF THE EQUIPMENT. THERE ARE NO OTHER WARRANTIES EXPRESSED OR IMPLIED, EXCEPT, SPECIAL WRITTEN WARRANTIES COVERING SOME MAGNETROL PRODUCTS.

UNDER RESERVE OF MODIFICATIONS

BULLETIN N°: BE 46-117.7
EFFECTIVE: JULY 2021
SUPERSEDES: March 2002

European Headquarters & Manufacturing Facility

Heikensstraat 6
9240 Zele, Belgium
Tel: +32-(0)52-45.11.11
e-mail: info.magnetrolbe@ametek.com

www.magnetrol.com



MAGNETROL®

AMETEK®