Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Саранск (8342)22-96-24
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 **Казахстан** +7(7172)727-132 **Киргизия** +996(312)96-26-47

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Технические характеристики на блоки управления DMCU900, регуляторы уровня воды в котле BVAB, SBDV, BMC компании Delta Mobrey

Technical **Datasheet**

delta-mobrey

Boiler Water Level Controls

Sequencing blowdown valves

Key **Features**

- One valve to provide separate blowdown of:
  - Control Chamber
  - Steam Connection
  - Water Connection
- Blowdown by predetermined sequence
- Back seating ensures packing is not subjected to continuous pressure
- Stainless steel trim
- Available with Metric or Imperial flanged connections as standard

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Series **Overview**

A purpose built flanged angle pattern isolating and sequencing valve with ½" BSPT screwed drain connection and back seating features, all valve trims are in stainless steel.

The Delta Mobrey sequencing valve is designed to function as a combined water isolating valve and a sequencing blowdown valve to provide positive purging of the water connection, float chamber and steam connection of a boiler control.

Blowdown of float chamber and connections is effected separately and in a predetermined sequence by the operation of the single specially designed hand-wheel.

The operation of the valve helps to ensure the water port does not become blocked by sediment, mud or debris. It also provides a positive test of the boiler water level control, ensuring that any associated equipment, such as the feedwater pump or valve, and any alarms, cutouts or lockouts operate as expected.

Other products

Other products we can offer :

Chamber mounted boiler water level controls

Direct mounted boiler water level controls

Boiler feed water modulation level controls and valves

Product **applications**

- Steam boiler external level control chamber isolation and purge

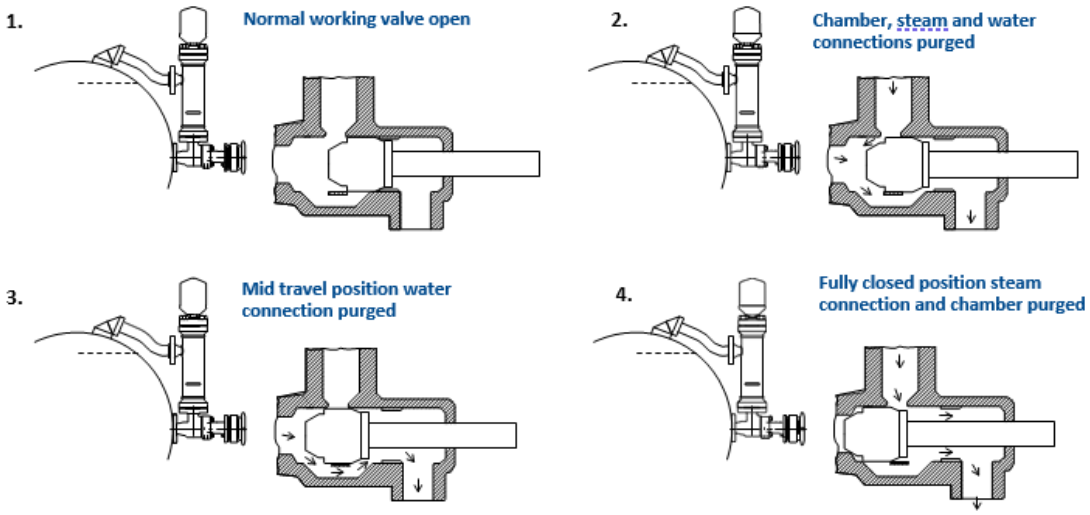
How to order

The instrument can be selected from the table below, which details the specification of each model. For assistance in selecting the model that best suits your needs, please contact your local sales office.

Part number	Flange connections to EN1092 (except where noted)	Valve body and stuffing box material	Maximum working pressure (bar)
80938	DN25 PN16	Cast iron	13 (1)
80947	DN25 PN25	Gunmetal	21
80951	DN25 PN40	Cast steel	32
81390	BS10 Table 'H'	Gunmetal	21

(1) The maximum working pressure is 10.5 bar for Lloyds applications

Sequence of operation



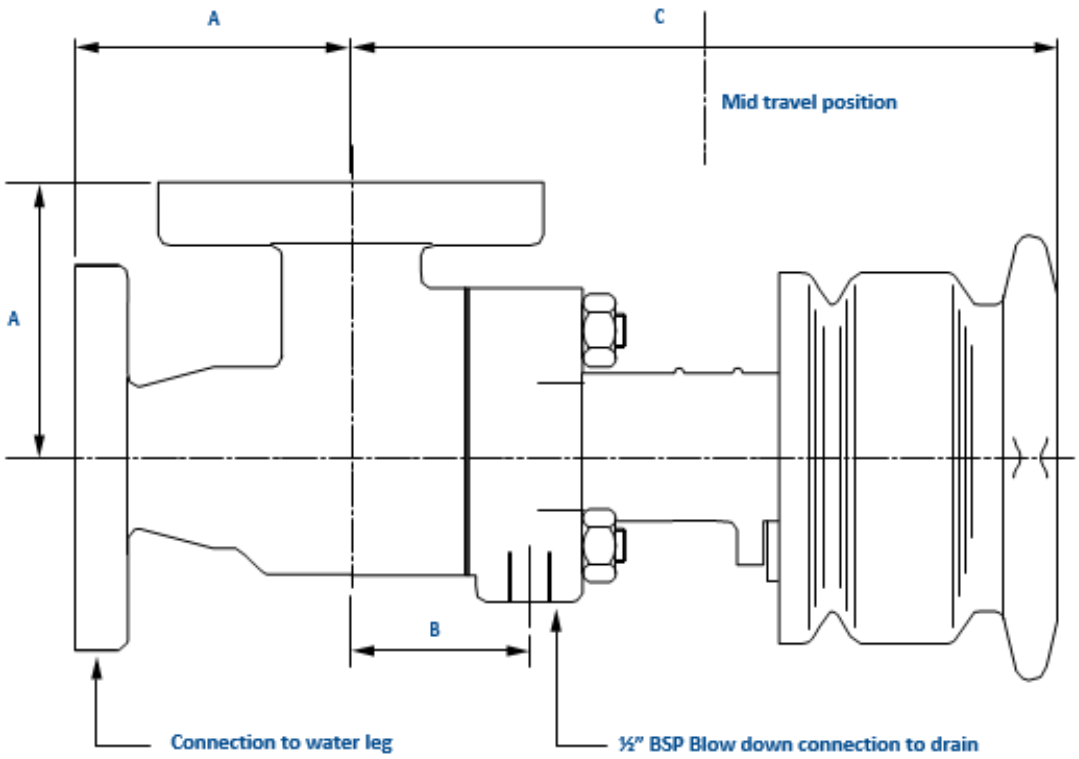
Important

The blowdown connection should be piped directly to an independent covered drain, or tun dish with removable lid, capable of accepting the full discharge without danger of blow-back. The bore of blowdown pipe should not be less than 12 mm and the length should be kept as short as possible. Sight glasses must not be fitted in the blowdown line.

Blowdown procedure card

Delta Mobrey produce a useful blowdown produces card, reference number BP109, which is available on request.

GENERAL DIMENSIONS



Part number	Dimensions (mm)		
	A	B	C
80938	83	54	219
80947	83	54	219
80951	83	54	219
81390	83	54	210

Technical **Datasheet**

Control Unit

Universal HART controller

Model: DMCU900 series

Key **Features**

- Controller for use with DMSP400, DMSP500 and DMSP900 series level transmitters via HART comms
- Display measured values, control pumps, actuators and alarms
- Configure Delta Mobrey HART transmitters, access diagnostics
- Single or dual transmitter inputs
- 4-20mA and up to five relay outputs
- Data logging option with SD card slot and RS485 comms
- DC or AC power supply
- Galvanically isolated supply to power Intrinsically Safe transmitters

---

Series **Overview**

The DMCU900 Series Universal Controller provides an interface between Delta Mobrey Ultrasonic Transmitters and operators or control systems.

All models have a large LCD display with push button menu driven programming. Options are available for data logging, with download facility. The DMCU900 provides an intrinsically safe power supply for I.S. transmitters. The wall mount model has a protective hinged lid with clear visibility of the display.

The DMCU900 series provides full functionality for configuration and diagnostics of any Delta Mobrey HART ultrasonic transmitter.

Other products

Other HART capable products we can offer:

- Ultrasonic level transmitters
- Pressure transmitters

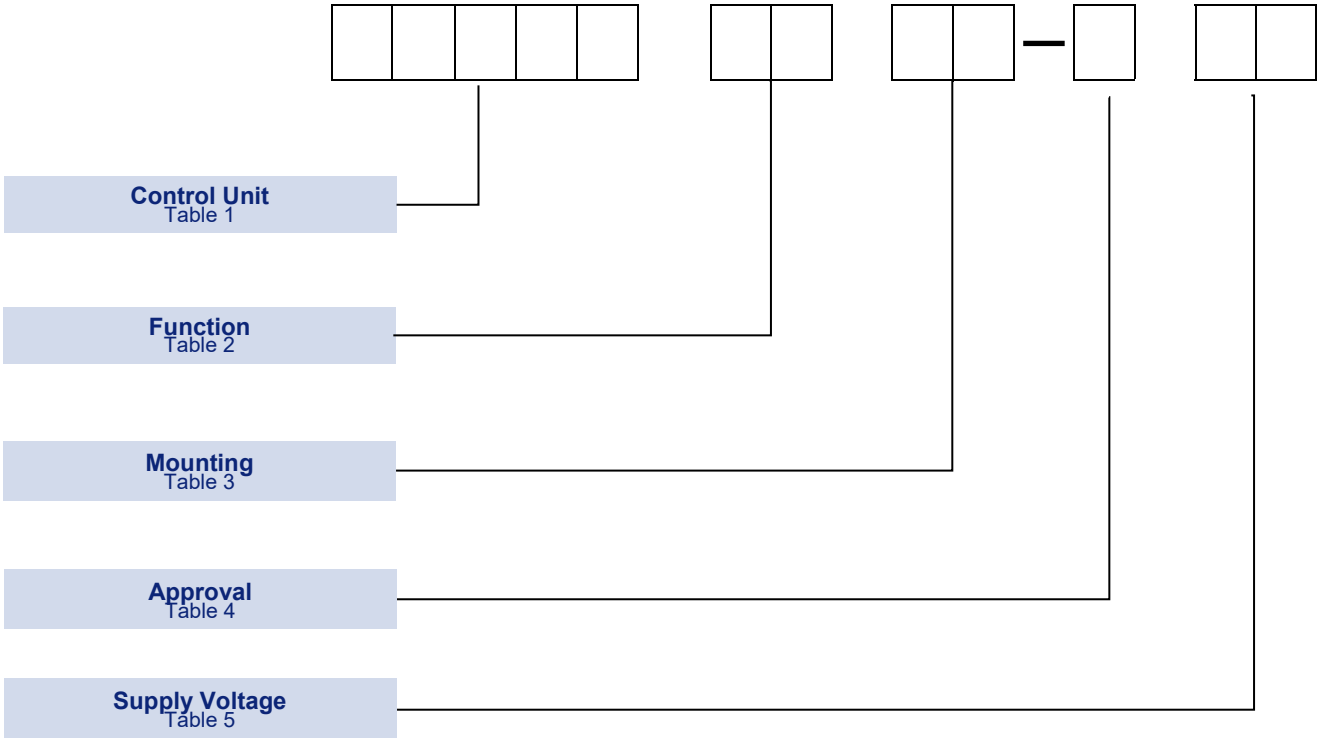
Product **applications**

When used with Delta Mobrey Ultrasonic Level Transmitters;

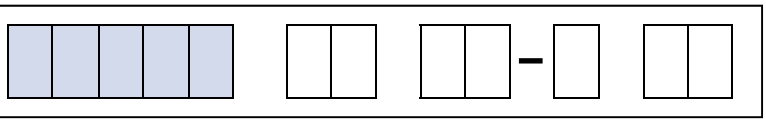
- Display of tank level or volume, of linear or non-linear tanks
- Pump control for tanks, wet wells, and sumps
- High or low alarms in storage tanks
- Open channel flow measurements of many weir and flume designs
- Differential measurement for blocked filter detection
- Acts as a HART master for Delta Mobrey Ultrasonic Level Transmitters

How to order

DMCU900 controllers can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.

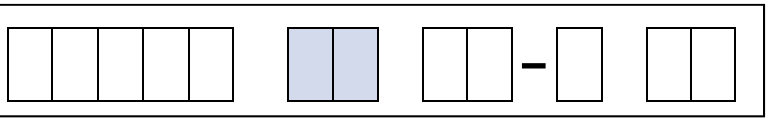


Models

TABLE 1 

Description	Code
Control unit. HART transmitter input(s)	**DMCU9**

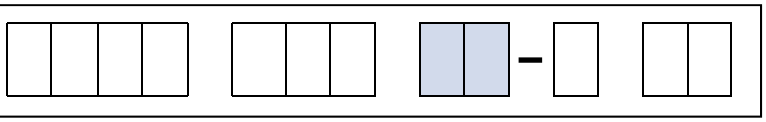
Function

TABLE 2 

Standard unit
Dual Hart transmitter inputs is for differential measurement.
Ideal for Open Channel Flow

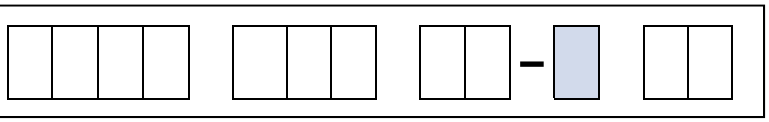
Description	Code
Single HART transmitter input. 4-20mA and 4 relay outputs	**01**
Dual HART transmitter inputs. 4-20mA and 4 relay outputs	**02**
Single HART transmitter input, logging and data download, 2 relay outputs	**0F**
Single HART transmitter input. 4-20mA and 5 relay outputs	**11**

Mounting

TABLE 3 

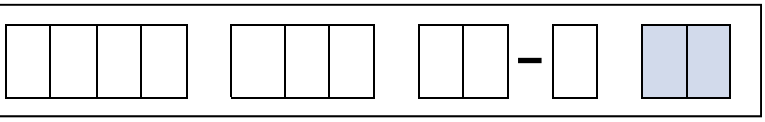
Description	Code
Wall mount	**WX**
Panel mount (only for 01 & 11 function)	**PX**

Approval

TABLE 4 

Description	Code
Safe area use only	**N**
ATEX hazardous area approval Ex II (1) G [Ex ia Ga] IIB, Ex II (1) D [Ex ia Da] IIIC	**A**

Supply

TABLE 5 

Description	Code
85 to 255V AC 50-60Hz 12VA	**no code**
11.4-40 V DC or 11.4-28 V AC 50-60Hz 12VA or 11W	**24**

Technical Specification

DMCU900 series: all models		DMCU9*1**-*	
Mounting	Wall mount or Panel mount	**Transmitter input**	One HART transmitter input
Display	128 x 64 LED dot matrix	**Output**	1 x 4-20mA
Housing material	60mm x 30mm Polycarbonate	**Relays**	DMCU901*** 4 relay outputs DMCU911*** 5 relay outputs All relays: SPDT 250V AC, 5A
Ambient Temperature	-20°C to +50°C		
Ingress protection	IP65		
DMCU9WX-A (mains supply)**		**DMCU902**-***	
Supply voltage	85 to 255V AC 50-60Hz	**Transmitter inputs**	Two HART transmitters input (for differential measurement)
Power requirements	12VA	**Output**	1 x 4-20mA
		Relays	4 SPDT 250V AC, 5A
DMCU9WX-A24 (low voltage supply)**		**DMCU90F**-***	
Supply voltage	11.4-40 V DC or 11.4-28 V AC 50-60Hz	**Transmitter input**	One HART transmitter
Power requirements	12VA or 11W	**Output**	1 x 4-20mA
		Relays	2 SPDT 250V AC, 5A
		Additional function	Data logging
		Additional output	SD card slot and RS485 comms

DMCU9** **-A	
ATEX Ex marking	Ex II (1) G [Ex ia Ga] IIB, Ex II (1) D [Ex ia Da] IIIC
Intrinsically safe data	Uo=30V; Io=140mA; Po=1W; Lo=4mH; Co=200nF; Um=253V

Approvals

EUROPEAN DIRECTIVES

Low voltage Directive (LVD) 2014/35/EU

Compliant to LVD

Electromagnetic Compatibility Directive (EMC) 2014/30/EU

Compliant to EMC directive

ATEX Directive 2014/34/EU

Intrinsically Safe: Associated apparatus

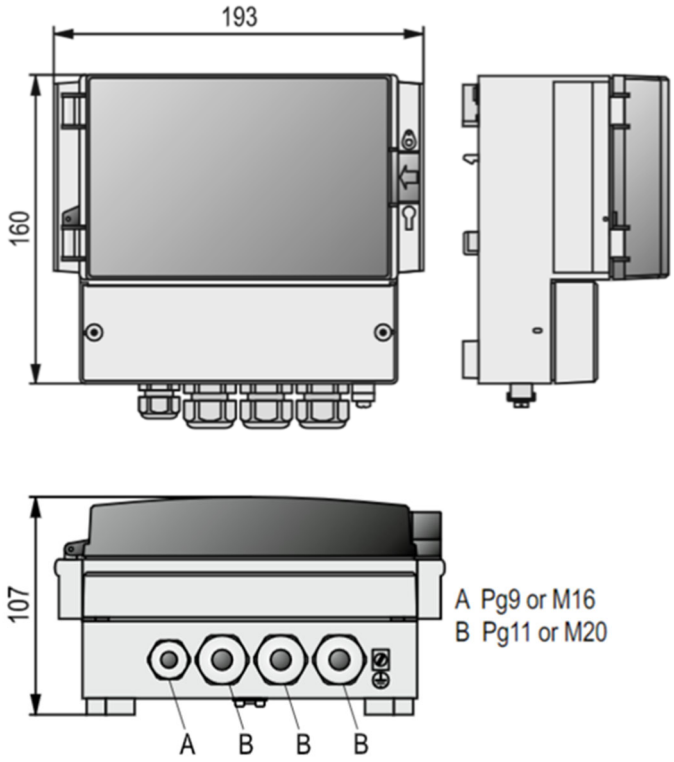
Certificate No. BKI20ATEX0018

EN IEC 60079-0, EN 60079-11

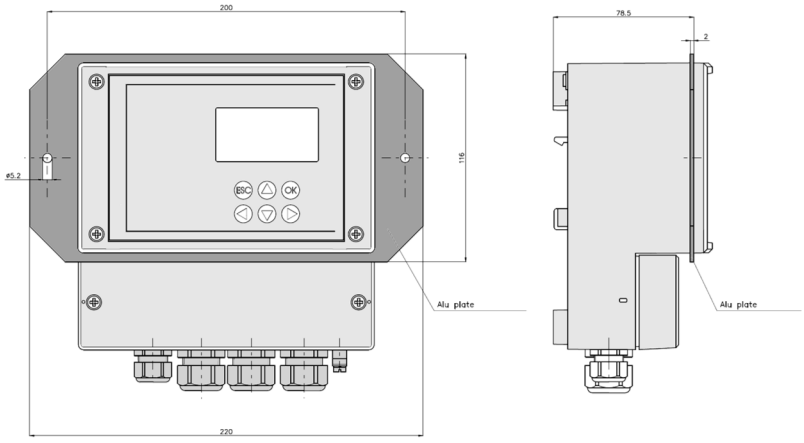
For connection to transmitters in Zone 0

II (1) G
[Ex ia Ga] IIB
II (1) D
[Ex ia Da] IIIC

Dimensions



Wall mount model for all functions



Panel mount model (only for function 01 & 11)
Panel cut out size: 166mm x 107mm

ISO9001
BSI REGISTERED
UKAS QUALITY MANAGEMENT 003
FM00720

Technical **Datasheet**

delta-mobrey

Boiler Water Level Controls

Vertical Air Break Controls

Key **Features**

- Unique 3 magnet latching switch mechanism
- No spring in switch mechanism
- Glandless construction
- Fail safe design
- Unaffected by foam

Product **applications**

- Water level (pump) control
- First low water alarm and cutout
- Second low water alarm and lockout
- High water alarm

Series Overview

Mobrey originally entered the industrial boiler control market in 1923 with a range of steam operated equipment. Since that time, the range has expanded to cover most aspects of control associated with the boiler house.

The Delta Mobrey Vertical Air Break Controls (VABC) are a comprehensive range of magnetically operated water level controls for steam boilers. They are designed to meet all requirements for automatic on/off control of boiler feed pump, burner cut out, high and/or low level alarm or any combination of these.

Models available with Industrial (NEMA4) or Marine Heads. TÜV approved models are available in chambers and for direct mounting.

The Delta Mobrey VABC is a gland-less construction. A primary permanent magnet is attached to the float rod and slides vertically inside a non-magnetic stainless steel centre tube. Movements of the float are transmitted to a secondary magnet in each switch unit.

There are two pairs of contacts which are operated with a snap-action and held by repulsion between the secondary magnet and the tertiary magnet of the switch unit assembly.

Other products

Other products we can offer :

- Boiler feed water modulation level controls and valves
- Sequencing blowdown valves

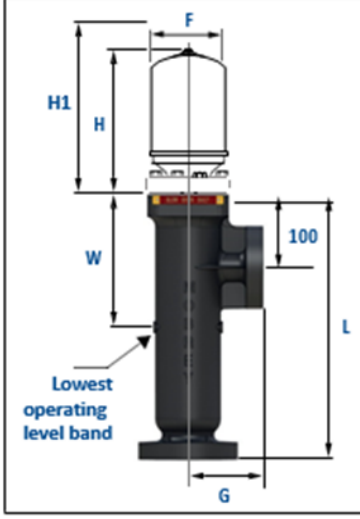
How to order

The instrument can be selected from the table below, which details the specification of each model. For assistance in selecting the model that best suits your needs, please contact your local sales office.

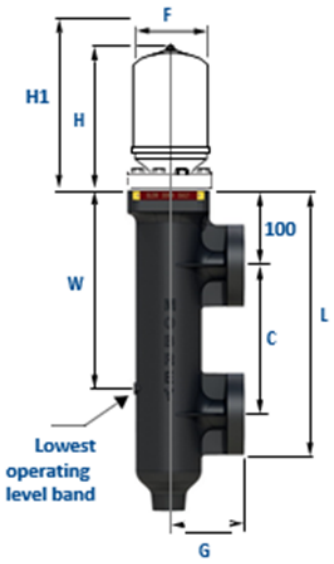
Explanation of type numbers

- The type numbers are arbitrary except that BX denotes chamber mounting and BD denotes direct mounting.
- The stroke number (e.g. ****/n) indicates the number of switch units fitted as standard. When extra switches are required, this stroke number will indicate the total number of switches to be provided.
- When Marine models are required the letter 'M' is inserted after the letters BX and before the number, e.g., the Industrial and NEMA 4 model BX05/2 becomes BXM05/2 when in Marine construction.
- Certain direct mount model have a test facility incorporated. These are identified by the letter 'T' after the letters BD and before the number, e.g. BDT02/2.

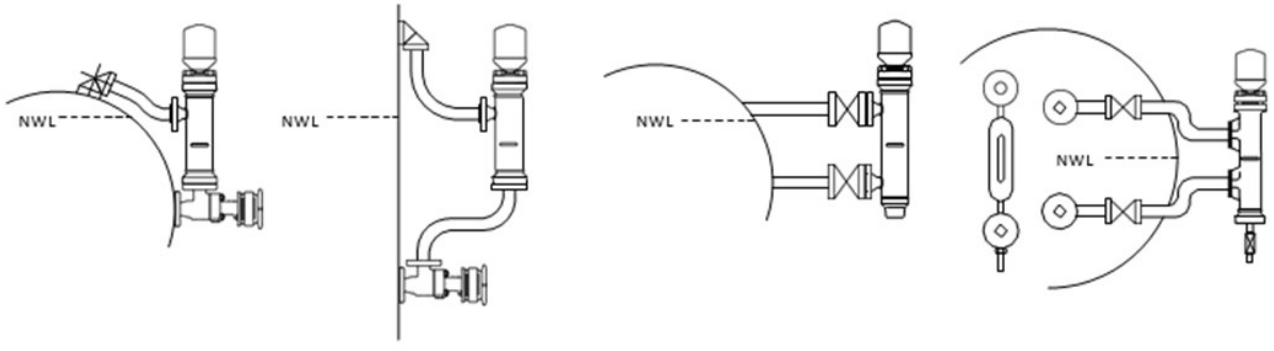
Side and bottom chamber mounted models: dimensional and operating data

Chamber and switch head	Type number	Operate range (mm)	No. of switches		EN1092 flanged and screwed connections	Dimensions						
			Std.	Max.		C	G	H	H1	L	W	F
	**Cast iron chamber (working pressure: 13 kg/cm²)**											
	BX02/1	62	1	-	DN25 PN16	-	102	193	303	366	182	160
	BX05/2	150	2	4	DN25 PN16	-	102	293	497	468	277	160
	BX07/2	250	2	6	DN25 PN16	-	102	393	602	557	370	160
	Fabricated steel chamber (working pressure: 21 kg/cm²)											
	BX09/1	62	1	-	DN25 PN40	-	87	193	303	366	182	160
	BX10/2	150	2	4	DN25 PN40	-	87	293	497	468	277	160
	BX11/2	250	2	6	DN25 PN40	-	87	393	602	557	370	160
	Fabricated steel chamber (working pressure: 32 kg/cm²)											
	BX12/1	62	1	-	DN25 PN40	-	102	193	303	366	182	160
	BX13/2	150	2	4	DN25 PN40	-	102	293	497	468	277	160
	BX14/2	250	2	6	DN25 PN40	-	102	393	602	557	370	160

Side and side chamber mounted models: dimensional and operating data

Chamber and switch head	Type number	Operate range (mm)	No. of switches		EN1092 flanged connections	Dimensions						
			Std.	Max.		C	G	H	H1	L	W	F
	Cast iron chamber with 1-in. BSP drain connection (working pressure: 13 kg/cm²)											
	BX03/1	62	1	-	DN 25 PN16	216	102	193	303	448	277	160
	BX15/1	62	1	-	DN20 PN16	180	100	193	303	480	240	160
	BX87/1	62	1	-	DN20 PN16	180	135	193	303	480	240	160
	BX16/2	120	2	4	DN20 PN16	180	100	293	497	480	240	160
	BX88/2	120	2	4	DN20 PN16	180	135	293	497	480	240	160
	BX06/2	150	2	4	DN 25 PN16	216	102	293	497	448	277	160
	BX08/2	250	2	6	DN 25 PN16	317	102	393	597	557	370	160
	Fabricated steel chamber with ½-in. BSP drain connection (working pressure: 21 kg/cm²)											
	BX17/1	62	1	-	DN20 PN40	270	100	193	303	570	335	160
	BX45/1	62	1	-	DN25 PN40	270	100	193	303	570	335	160
	BX18/2	120	2	4	DN20 PN40	270	100	293	497	570	335	160
	BX19/2	150	2	4	DN20 PN40	270	100	293	497	570	335	160
	BX20/2	150	2	4	DN25 PN40	270	100	393	497	570	335	160
	BX21/2	215	2	6	DN20 PN40	270	100	393	602	570	335	160
	BX22/2	215	2	6	DN25 PN40	270	100	393	602	570	335	160
	Fabricated steel chamber with ½-in. BSP drain connection (working pressure: 32 kg/cm²)											
	BX23/1	62	1	-	DN 25 PN40	350	112	193	303	595	372	160
	BX24/2	150	2	4	DN 25 PN40	350	112	293	497	595	372	160
	BX25/2	250	2	6	DN 25 PN40	350	112	393	597	595	372	160

Typical mounting arrangements for chamber mounted controls



Side and bottom entry chamber with sequencing valve on horizontal boiler

Side and bottom entry chamber with sequencing valve on vertical boiler

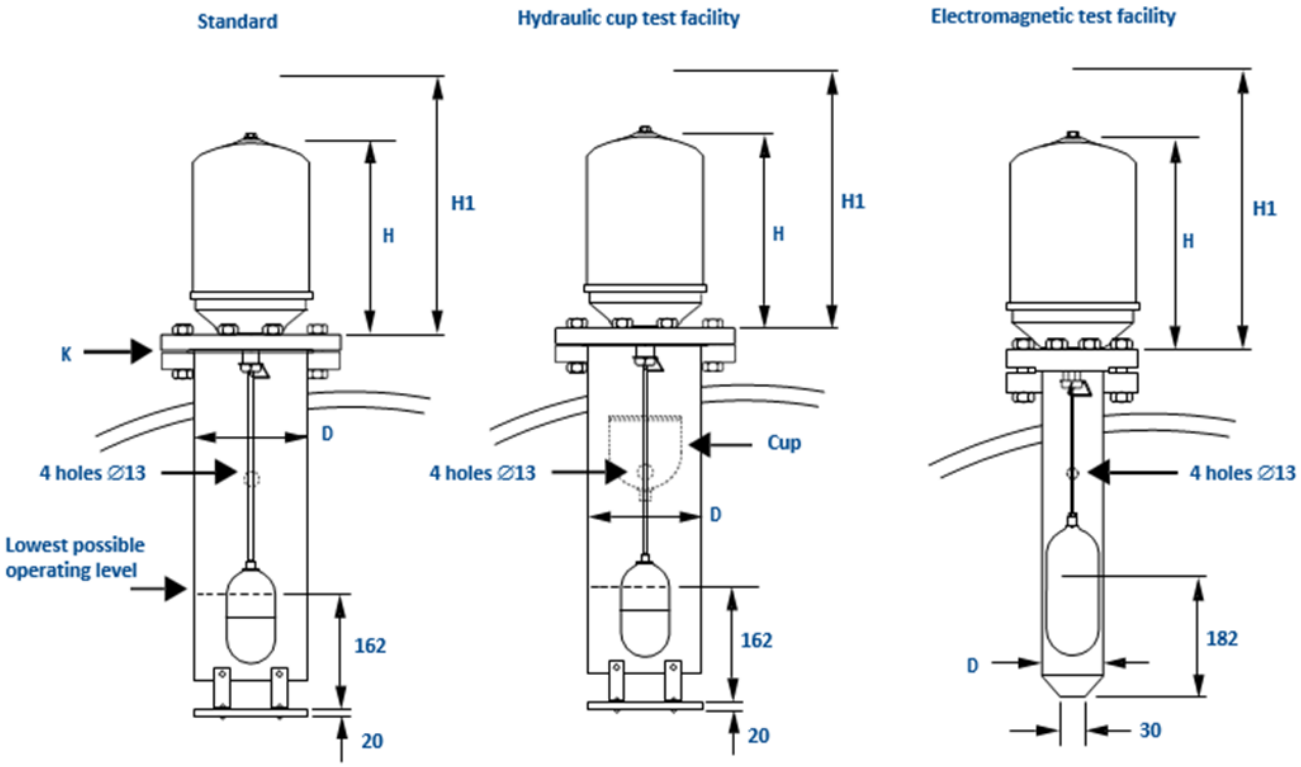
Side and side entry chamber on horizontal boiler

Side and side entry chamber on steam drum of water tube boiler

Direct mounted models: dimensional and operating data

Type number	Working pressure at saturated steam kg/cm²	Operate range in mm	No of switches		Forged steel flanged connections	Float length x diameter	Dimensions			Max. float rod length
			Std.	Max.			D min.	H	H1	
Standard										
BD01/1	21.0	62	1	1	EN1092 DN100 PN40	152 x 67	77	193	303	765
BD02/2		150	2	4				293	497	
BD03/2		250	2	6				393	597	
BD04/1	32.0	62	1	1	EN1092 DN100 PN40	155 x 90	100	193	303	1016
BD05/2		150	2	4				293	497	
BD06/2		250	2	6				393	597	
BD07/2	21.0	120	2	4	BM115mm Sq	152 x 67	77	293	497	260
BD08/1		62	1	1				193	303	765
BD09/1		62	1	1				193	303	356
BD10/1		62	1	1				193	303	260
BD11/2	21.0	150	2	4	BM115mm Sq	152 x 67	77	293	497	765
BD12/2		150	2	4				293	497	356
BD13/2		150	2	4				293	497	298.5
BD14/2		215	2	6				293	602	356
BD15/2		250	2	6				293	602	765
BD16/2		250	2	6				293	602	394
BD21/2	32.0	150	2	4	EN1092 DN100 PN40	155 x 90	100	293	497	385
BD22/2		250	2	6			100	393	602	385
BD41/2	21.0	62	1	1	EN1092 DN100 PN40	152 x 67	77	193	303	298.5
BD42/2		62	1	1			77	193	303	394
BD43/1	32.0	62	1	1	EN1092 DN100 PN40	155 x 90	100	193	303	1016
BD44/2		150	2	4			100	293	497	1016
Hydraulic cup test facility										
BDT01/1	32.0	62	1	1	EN1092 DN100 PN40	155 x 90	100	193	303	1016
BDT02/2		150	2	4				293	497	
BDT03/2		250	2	6				393	597	
Electromagnetic test facility										
BDT04/1	21.0	–	1	–	BM128mm sq DN100 PN40	155 x 90	100	293	497	1016
BDT05/1	32.0	–	1	–						

Typical mounting arrangements for direct mounted controls

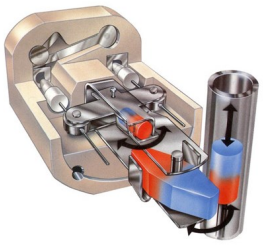


Technical Specifications

Electrical ratings for Single-Pole Double-Throw (SPDT) operation

AC maximum values			DC maximum values				
VA	Volts	Amps	Watts	Volts	Resistive amps	Inductive amps	Inductive time constant
2000(1)	440	5	50	250	5	0.5(2)	40 ms

(1) Maximum power factor is 0.4.
(2) Maximum up to 2 A dependent upon time constant of circuit. Consult factory.

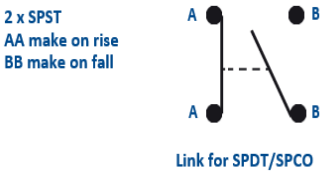


Note

- Switches must not be used for the direct starting of motors.
- Contacts should be wired in series with the operating coils of relays, contact starters or solenoid valves, and fused separately.
- Two 25 mm BS4568 cable entries are provided for the electrical connections. A sufficient length of flexible cable must be fitted to permit easy removal of the switch head and float assembly for routine maintenance.

Operating Levels

Differentials

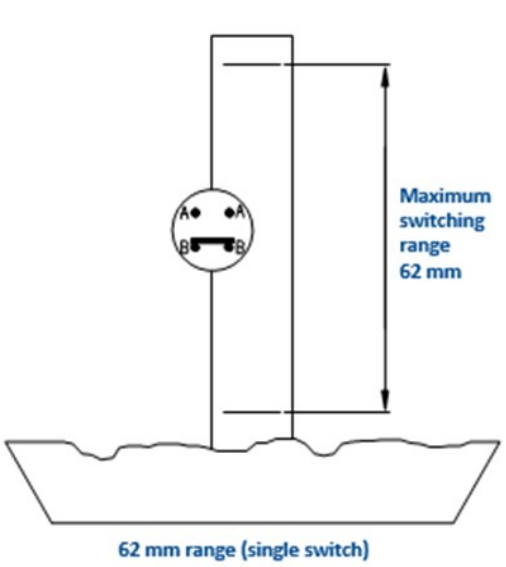


Each level switch has a nominal fixed water level differential of 25 mm between circuits A-A and B-B. To obtain a differential greater than 25 mm, two switch units must be used. The minimum water level differential for two switch units is 33 mm, with switch centres positioned 8 mm apart.

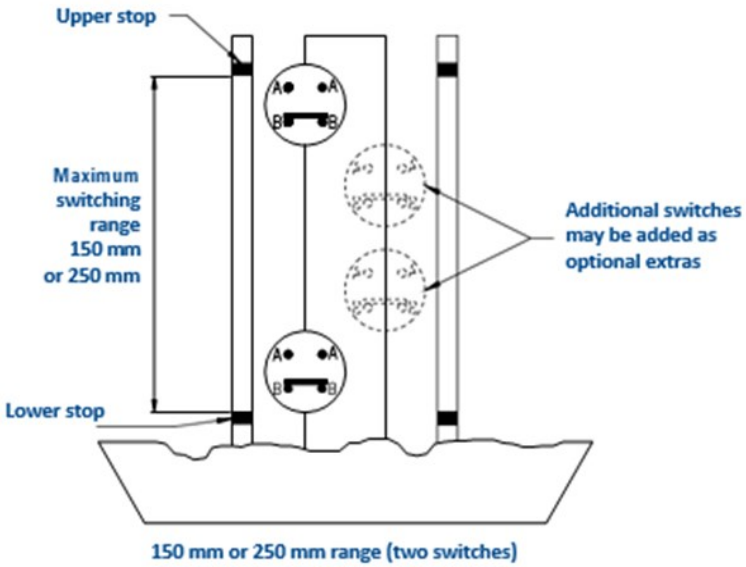
The maximum adjustable differential for two switch mechanisms varies with the operating range of each model,i.e. the distance between a rising and falling level which is required to operate the switches positioned at the extreme ends of their adjustments.

Switches have adjustments as follows:

- 62 mm range: 37 mm adjustment + 25 mm fixed differential = 62 mm
- 150 mm range: 125 mm adjustment + 25 mm fixed differential = 150 mm
- 250mm range: 225 mm adjustment + 25 mm fixed differential = 250mm



62 mm range (single switch)



150 mm or 250 mm range (two switches)

Chamber mounted models

Float chambers are manufactured in these approved materials:

Cast iron equal to BS1452 Grade 17
– for up to 13 kg/cm2 rating.

Fabricated steel BS3602 - HFS 27
– for both 21 kg/cm2 and 32 kg/cm2 ratings.

For chamber dimensions and process connections arrangement refer to the ordering information above.

Switch heads contain one or more switching mechanism units mounted in a housing comprising die-cast base with a zinc coated mild steel casing.

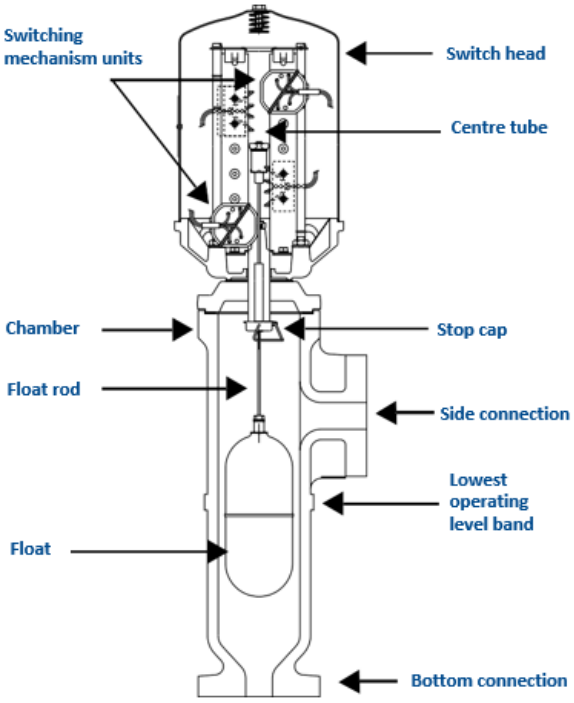
Two 25mm BS.4568 cable entries are provided.

Switching mechanism units have single pole double throw contacts, are latching and are positioned and held in place by clamp screws.

The centre tube is made of non-magnetic stainless steel and expanded into the top cover flange. It is fitted with a stop cap which also acts as a guide for the float rod carrying the primary magnet.

Floats are manufactured in Monel metal.

Float rods are manufactured in stainless steel.



The Chamber band mark indicates the lowest adjustment position of the low level alarm. We recommend that the positioning of the boiler control chamber is relative to the water level gauge glass and that, even at the lowest operating band level, the N.W.L. is such that there is always water visible in a gauge glass. Arrangements of Delta Mobrey Vertical Air Break Controls on various types of boiler are shown below.

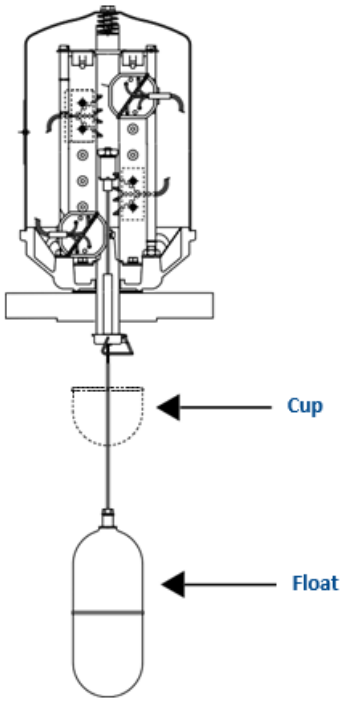
Direct mounted models (standard models)

Direct Mounted Vertical Air Break Controls have the same principles of operation and piece parts as the chamber-mounted equivalents, except that the chamber is exchanged for (1) a large round flange and (2) the tube assembly for mounting the control directly on to the boiler shell connection.

A fixed or removable stilling or guide tube should be provided to ensure that the float rod is not damaged and the correct vertical movement is achieved.

Direct mounted controls incorporating test facilities

These controls have the provision for testing the operation of the mechanism without lowering the level of water in the boiler. Testing can be initiated manually or by a timer. U.K. Patent 1279504 or 1473939 and international equivalents.



Hydraulic cup test facility

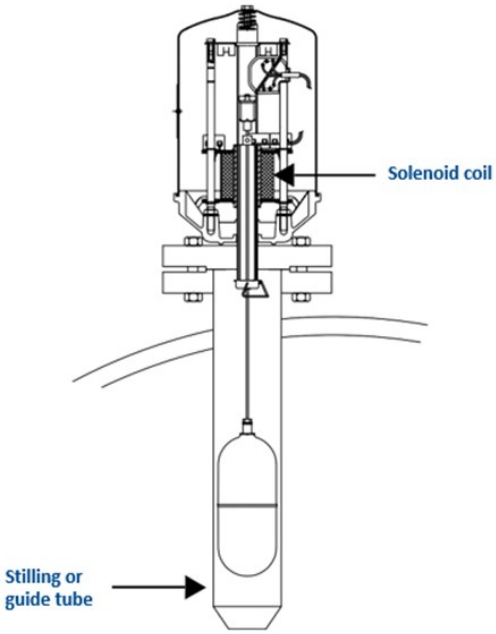
The test is achieved by lowering the float to the low water alarm level, by the following means:

The float rod includes a cup, above the float, which is fed with water from the boiler feed pump via small bore pipework and valves through the control mounting flange for approximately 24 seconds. The additional weight overcomes the buoyancy of the float, causing it to sink, stop the burner firing and operate the alarm system. After closing the test valve in the supply from the feed pump to the control, a small hole in the bottom of the cup drains off the water, permitting the float to rise to the normal operating position. Control of the water supply to the cup can alternatively be by means of a solenoid valve, which can be initiated by a timer or a manually operated push button. In this design the alarm switch remains fully adjustable.

Electromagnetic test facility

The switch head includes an inductive coil below the single switch subassembly. This surrounds an armature located inside the stainless steel centre tube and fixed to the float rod.

To initiate the test cycle, the coil can be energised by a timer or a manually operated push button and the float will be thrust downwards to stop the burner firing and operate the alarm system. When the coil is de-energised the float rises to its normal level. In this design the alarm switch unit is not adjustable.



Approvals

EUROPEAN DIRECTIVES

Pressure Equipment Directive (PED) 2014/68/EU:
The level controls and cast chambers are categorised as Sound Engineering Practice (SEP) under Article 4.3.

The fabricated chambers are category 1 under Article 4.1(c)(i) for Group 2 fluids and CE marked under Module H

Marine Type Approvals

American Bureau of Shipping
Bureau Veritas
Det Norske Veritas, Germanischer Lloyd
Russian Maritime Register of Shipping

TUV approved models (side and side connections only) are available on request.
Before ordering, please contact us. If the models shown here do not meet your specific requirements, please contact us for assistance.

Technical **Datasheet**

delta-mobrey

Boiler Water Level Controls

Modulation Level Controls

Key **Features**

- Easily adjusted for individual operating requirements
- Instant reversion to hand control in an emergency
- Glandless construction
- Fail safe design
- Unaffected by foam

Series Overview

Mobrey originally entered the industrial boiler control market in 1923 with a range of steam operated equipment. Since that time, the range has expanded to cover most aspects of control associated with the boiler house.

The Mobrey Modulating Controller is a single element electro-hydraulic control with an electronic feedback, used for controlling the flow of feed water into the boiler. Designed to be used alongside the Delta Mobrey Vertical Air Break Controls (VABC). It is a system of parts, comprising of:

i) A float operated control unit, either chamber mounted or directly mounted on the boiler shell, fitted with an Inductance Coil 'A' head assembly which can be made suitable for either Industrial or Marine applications.

ii) A flanged modulating feed water control valve, fitted with an Inductance Coil 'B' and twin solenoid valve assembly, which is mounted in the boiler feed water line.

iii) An electronic control box.

Product **applications**

- Water level (feed water valve) control
- First low water alarm and cutout

Other products

Other products we can offer :

- Boiler feed water modulation level controls and valves
- Sequencing blowdown valves

How to order

The instrument can be selected from the table below, which details the specification of each model. For assistance in selecting the model that best suits your needs, please contact your local sales office.

Modulation level control models

Type number	81006	81007	81008	81951
Material	Cast iron	Fabricated steel	Fabricated steel	Forged steel flange
Max. pressure kg/cm^2	13	21	21	32
Connections	Side and bottom EN1092 DN25 PN16	Side and bottom EN1092 DN25 PN40	Side and side EN1092 DN25 PN25	Direct mounted EN1092 DN100 PN40

Models are available for up to 32kg/cm2 steam working. Details on request.

Modulation control box models

Type number	80436	80660
Input supply	240 Vac 50/60 Hz ±10%	110 Vac 50/60 Hz ±10%

Important notice

Electronic control box must not be subjected to either vibration or excessive temperature. It is therefore recommended that they are NOT mounted directly on to the boiler shell.

Modulation control valve models

Type number	Flanged	No. of solenoid valves	Electrical supply
80310/*	1½" table H	2	230 Vac 50 Hz
80311/*	DN40 PN40	2	230 Vac 50 Hz
80653/*	DN40 PN40	2	110 Vac 50 Hz
80486/*	DN40 PN40	2	230 Vac 50 Hz
80310/80435/*	1½" table H	3	230 Vac 50 Hz
80311/80435/*	DN40 PN40	3	230 Vac 50 Hz
80653/80435/*	DN40 PN40	3	110 Vac 50 Hz

Note

The internal trim on the modulating valve can be changed without the need to replace the valve should operating conditions change.

* denotes the size of the valve lid & seat (A-I). Valves can be supplied without the lid and seat fitted.

Operation

A positive change of water level in the boiler alters the inductance value of Coil “A” causing an imbalance in the system. This signal is transmitted through the electronic control box to the appropriate solenoid valve on the modulating valve thus producing a change of hydraulic pressure on the piston assembly, the movement of which modulates the flow of water to the boiler.

Simultaneously this same vertical travel creates a change in the inductance value of Coil “B” until the balance is restored, thus closing the solenoid valve and hydraulically locking the modulating valve spindle.

This sequence is repeated in very small steps until the feed water input equals the required evaporation rate of the boiler.

To prevent the modulating valve responding to random water movement against the general direction of level change, a 13 mm reversal or (dead) band is incorporated in the electronic circuitry.

Low water alarm and burner cut out contacts are also provided within the control box to operate when the water level falls to a predetermined position.

Installation notes

For the further safety of boilers, it is recommended that the Mobrey Control Unit is mounted on a Mobrey Sequencing Valve.

The water connection from the boiler to the float chamber should be as short as possible and the control head float chamber should be mounted close to the gauge glasses.

The chamber band mark indicates the lowest adjustment position of the low level alarm and it is our recommendation that the positioning of the boiler control chambers relative to the water level gauge glasses and the N.W.L. is such that there is always water visible in the gauge glass even at the lowest operating band level. If required our technical staff will advise on individual installations.

Application notes

Throttle control

Modulating Valve in feed line
Suitable for automatic cold start conditions
Used for all pumps capable of operating against a closed discharge.

With a rising water level in the boiler, the modulating valve closes progressively to reduce the rate of feed into the boiler. The size of valve lid is determined by the actual capacity of the boiler plus an allowance. See below for the sizing of the valve lids.

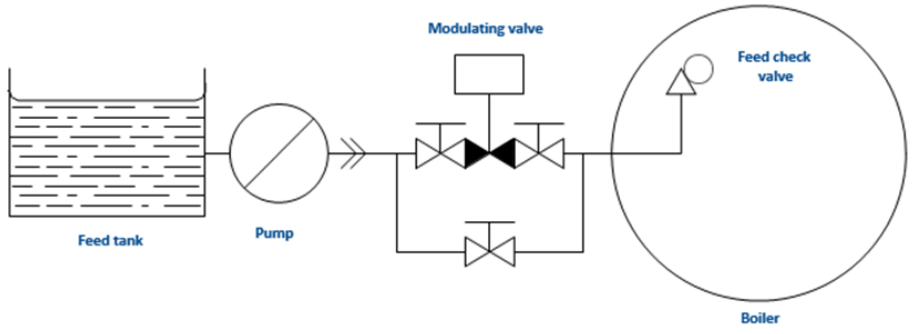
Power failure and high water shutdown – with a third solenoid valve

Where one pump is feeding more than one boiler it is imperative that a boiler cannot be overfilled. Therefore a third solenoid valve can be installed on the modulating valve which is operated by either a loss of power on the boiler control circuit or the high water alarm. In either case the valve will be closed and prevent further water entering the boiler. The third solenoid valve can be retrofitted to existing valves.

Common feed pump arrangement

Multi-boiler installations operating on a common feed system require special sizing consideration and full details should be provided so that a suitable valve can be recommended.

Typical installation of the modulation valve



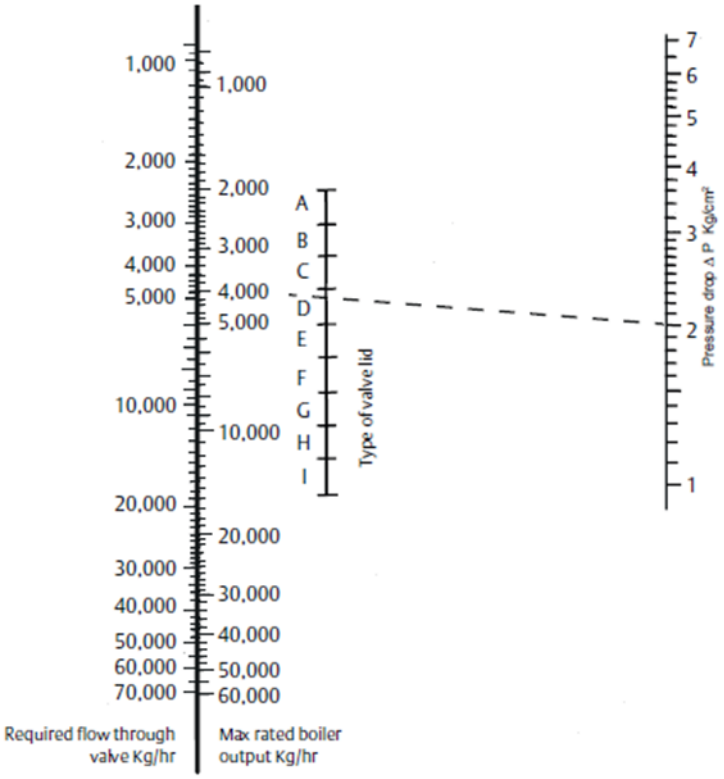
Sizing of valve lids

A range of valve lids and associated seats are available, and provide linear flow characteristics. A table of Cv values for water (S.G.=1) is given below for valve lids in the fully open position.

Sizing of the valve lids

Type of lid	Cv = kg/hr for 1 kg/cm²
A	1690
B	2260
C	3030
D	4100
E	5480
F	7480
G	9840
H	13520
I	18480

Modulation control valve sizing chart



The formula for determining the Cv value and correct size of valve lid are given below. The pressure drop across the valve should be 1.4 kg/cm² or greater – normally, the higher the pressure drop the better the degree of control. The lid size is that with the nearest Cv value above the calculated value.

$$Cv = \frac{Q}{\sqrt{P}}$$

Where:

Q = Actual Evaporation of Boiler plus 15 per cent margin kg/hr.
P = Pump discharge pressure in kg/ cm² when passing Q quantity of water minus (boiler max working pressure + 0.4 kg/cm²).

In the following example, an allowance of 0.4 kg/cm² has been made for all feed line losses. In practice, the allowance should be that of the installation under consideration and may well be in excess of 0.4 kg/cm², particularly where the feed pump is remote from the boiler and/or where an anti-siphon valve adjacent to the boiler feed check valve has been fitted.

Example

Boiler evaporation (actual) = 4000 kg/hr.
Boiler working pressure = 6.6 kg/cm²
Pump discharge pressure at Q quantity = 6.6 kg/cm²

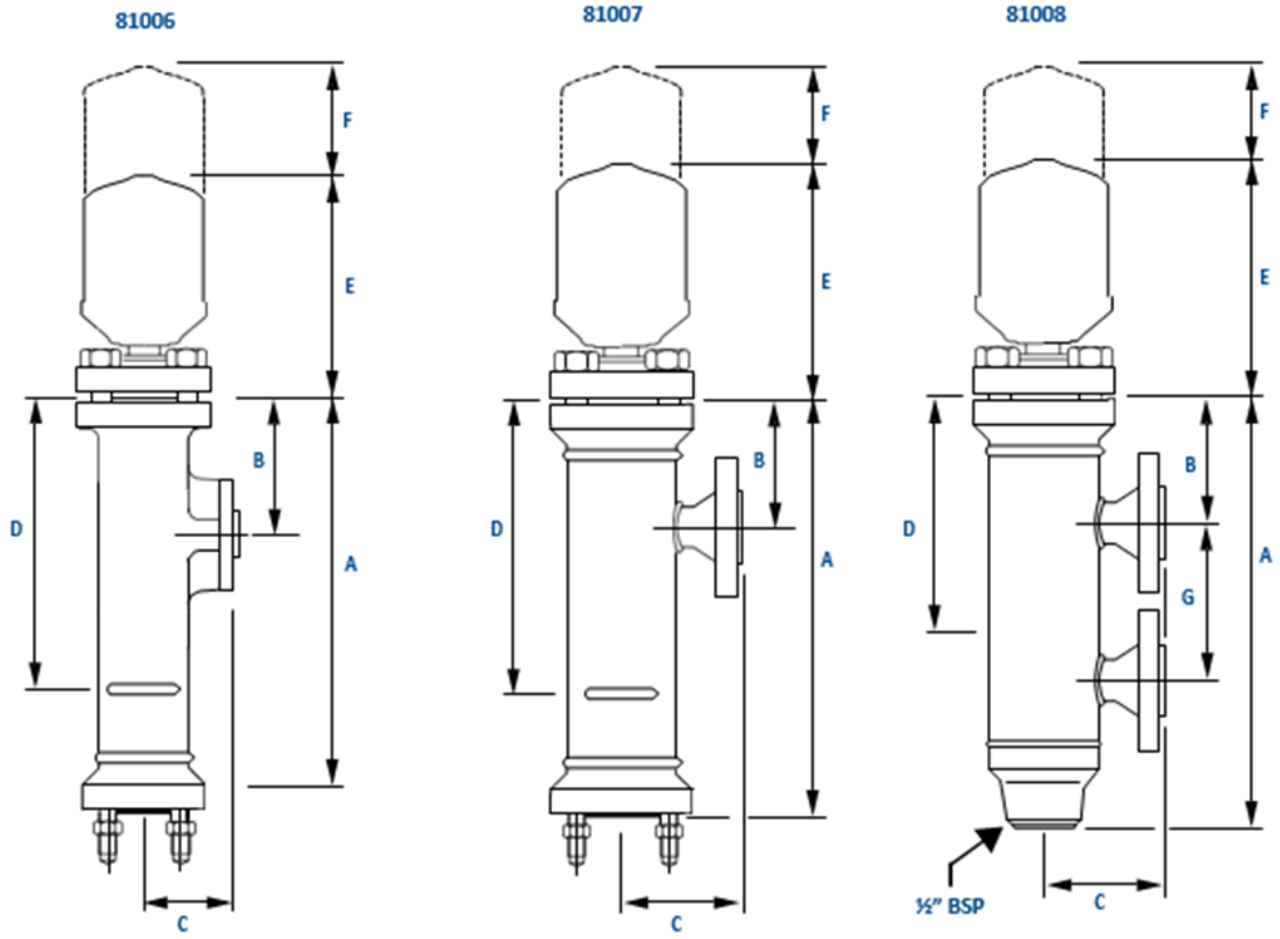
$$Cv = \frac{4000 \times 1.15}{\sqrt{11 - (6.6 + 0.4)}} = 2300$$

Lid required: Type C

Technical Specifications

Dimensional and operating data

Standard control heads and chambers



Type number	81006	81007	81008	81951
Material	Cast iron	Fabricated steel	Fabricated steel	Forged steel flange
Max. pressure kg/cm²	13	21	21	32
Connections	Side and bottom EN1092 DN25 PN16	Side and bottom EN1092 DN25 PN40	Side and side EN1092 DN25 PN25	Direct mounted EN1092 DN100 PN40
A	468	468	570	–
B	100	100	100	–
C	102	87	100	–
D	277	277	335	–
E	390	390	390	390
F	430	430	430	430
G	–	–	270	–

Chamber mounted models

Float chambers are manufactured in these approved materials:

Cast iron equal to BS1452 Grade 17
– for up to 13 kg/cm2 rating.

Fabricated steel BS3602 - HFS 27
– for both 21 kg/cm2 and 32 kg/cm2 ratings.

For chamber dimensions and process connections arrangement refer to the dimensional and operating information above.

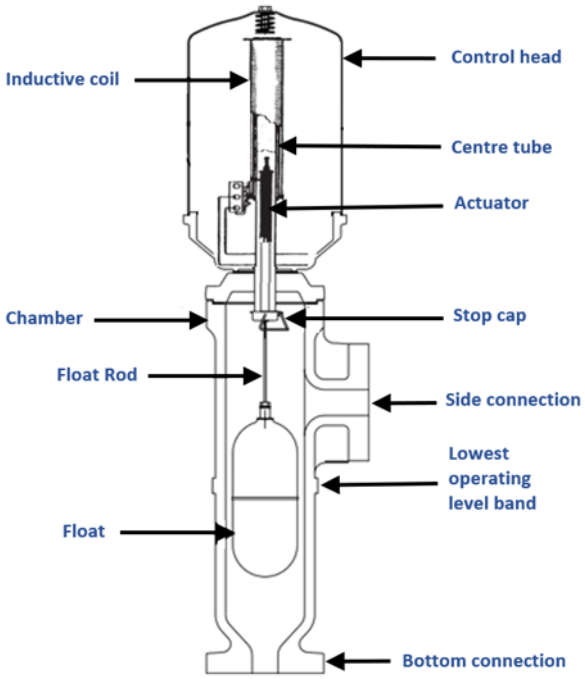
Control heads contain an inductive coil in a housing comprising die-cast base with a zinc coated mild steel casing.

Two 25mm BS.4568 cable entries are provided.

The centre tube is made of non-magnetic stainless steel and expanded into the top cover flange. It is fitted with a stop cap which also acts as a guide for the float rod carrying the actuator.

Floats are manufactured in Monel metal.

Float rods are manufactured in stainless steel.



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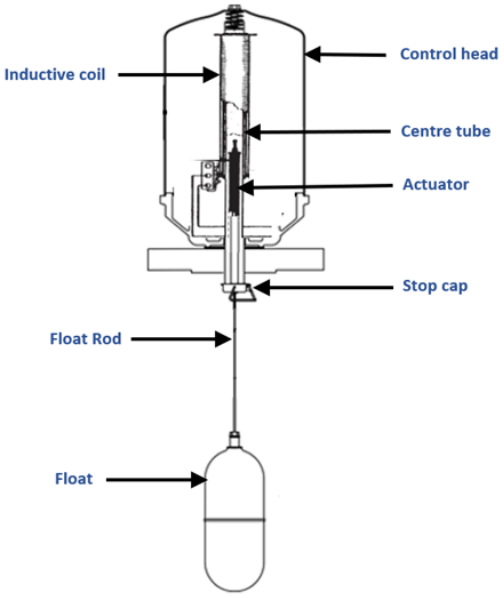
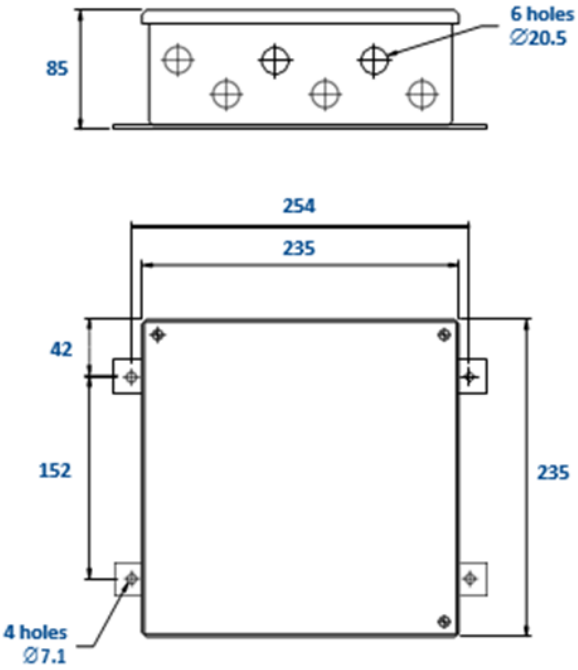
Direct mounted models

Direct Mounted Modulation Level Controls have the same principles of operation and piece parts as the chamber-mounted equivalents, except that the chamber is exchanged for (1) a large round flange and (2) the tube assembly for mounting the control directly on to the boiler shell connection.

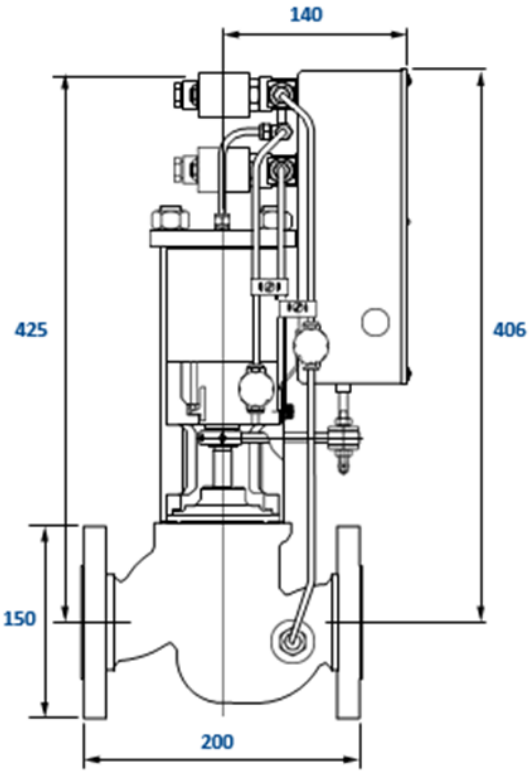
A fixed or removable stilling or guide tube should be provided to ensure that the float rod is not damaged and the correct vertical movement is achieved.



Control box



Modulation valve



Electrical characteristics

Input circuit protected by 1 amp HRC fuse.

Alarm and control relays protected by 2 amp HRC fuses. Relay contacts voltage free rating:-

Maximum voltage: 250 Vac

Maximum current: 2 amp

Facility available to special order for separate supply to solenoid valves with 2 Amp HRC

Valve body material: Cast steel

Flanged EN1092 DN40 PN40 or 1½" BS10 table H

Minimum feed line pressure: 5.3 kg/cm^2

Maximum feed line pressure: 40 kg/cm^2

Maximum feed line temperature: 120^{O}C*

*180^{O}C is available as high temperature option on request.

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
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Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
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Калининград (4012)72-03-81
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Кемерово (3842)65-04-62
Киров (8332)68-02-04
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Кострома (4942)77-07-48
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Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
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Якутск (4112)23-90-97
Ярославль (4852)69-52-93

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