



Danfoss ICAD 600B Motorized Valve Control Installation Guide

[Home](#) » [Danfoss](#) » Danfoss ICAD 600B Motorized Valve Control Installation Guide 

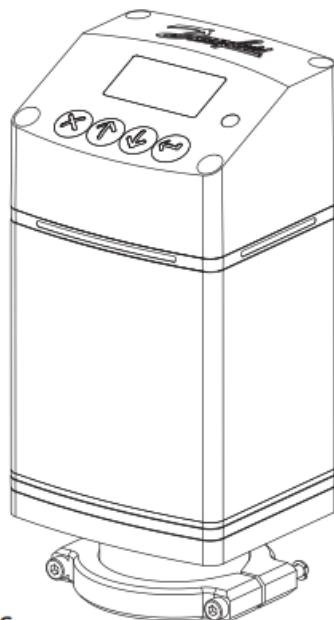
Danfoss ICAD 600B Motorized Valve Control



Contents

- 1 Installation Instructions
- 2 Installation
- 3 Use
- 4 Electrical data
- 5 24 Volt DC ONLY
- 6 Temperature range (ambient)
- 7 Enclosure
- 8 Electrical connection
- 9 Electrical installation
- 10 Mechanical installation
- 11 Power on & start operation
- 12 Set valve (A1 alarm)
- 13 Change analog input signal (optional)
- 14 Documents / Resources
 - 14.1 References

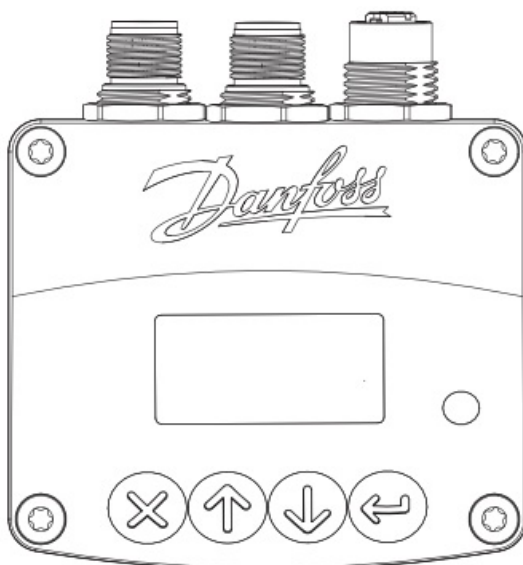
Installation Instructions



ICAD 600B
ICAD 600B-TS
ICAD 1200B

1

ICAD 600B
ICAD 600B-TS
ICAD 1200B



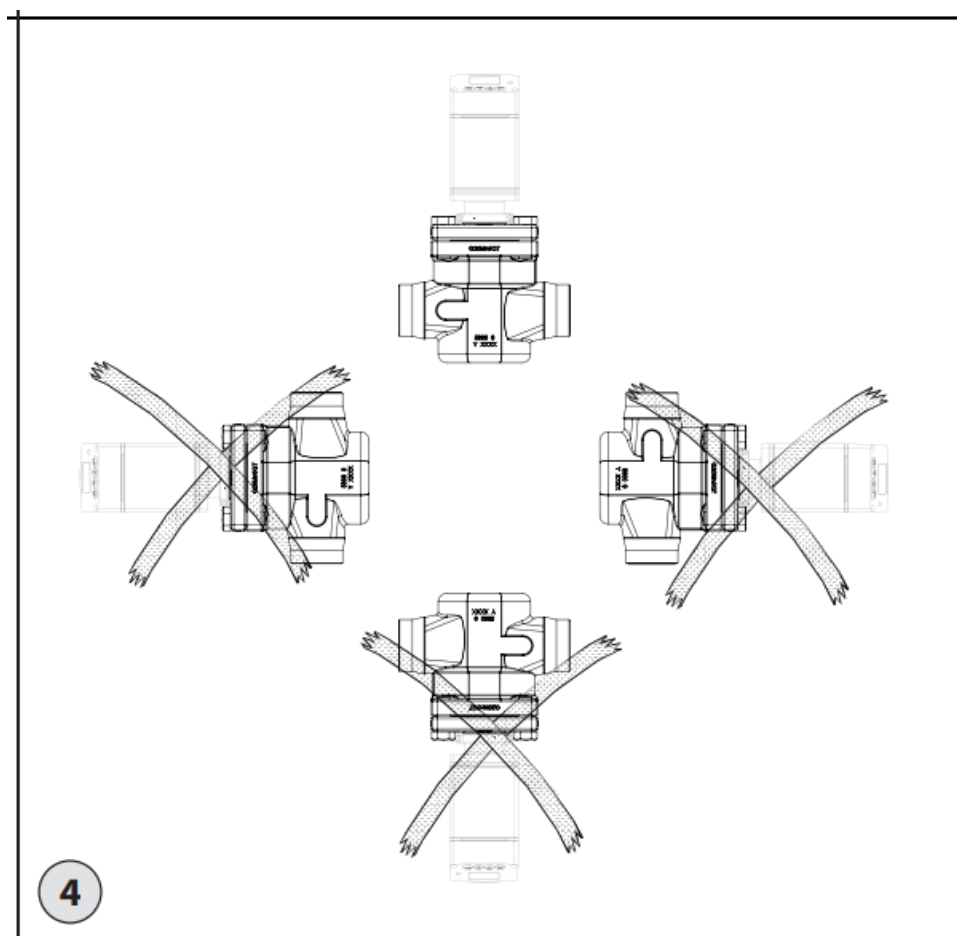
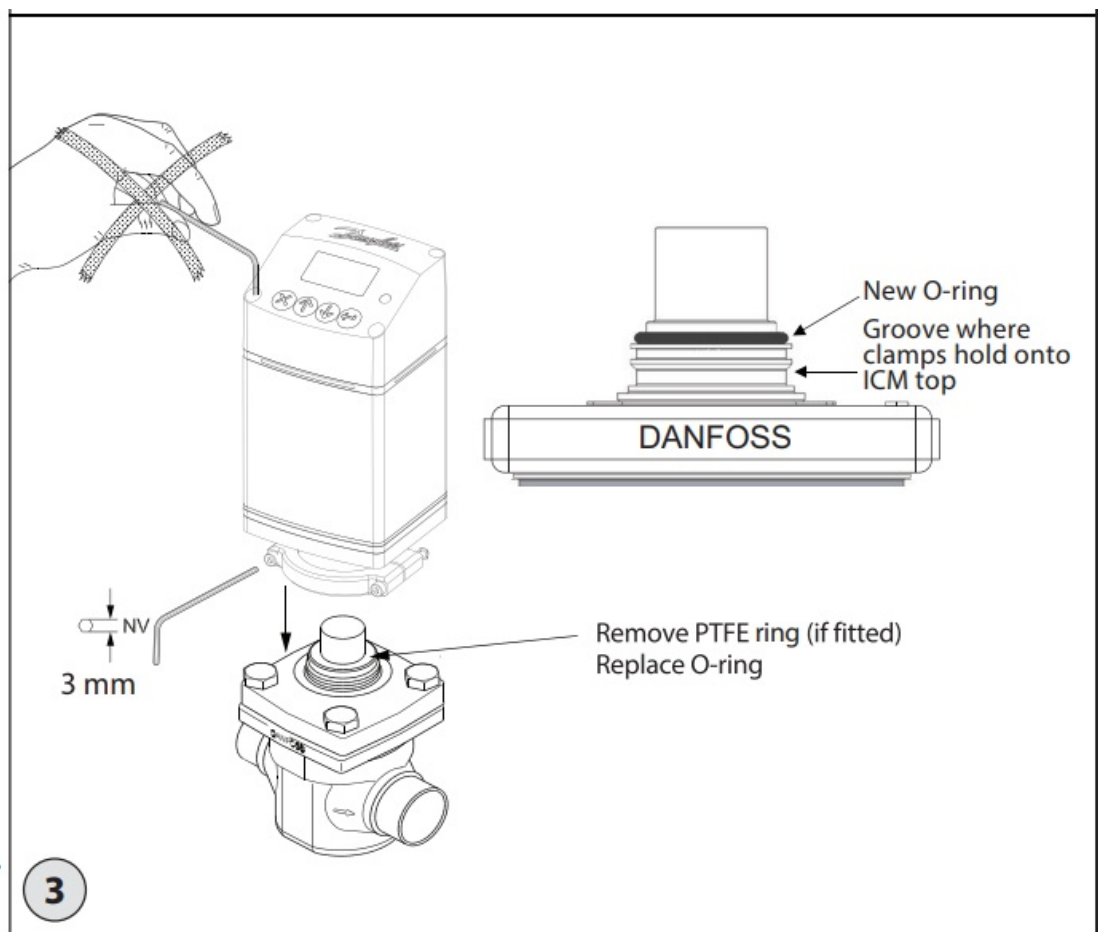
Buttons and display description in page 4

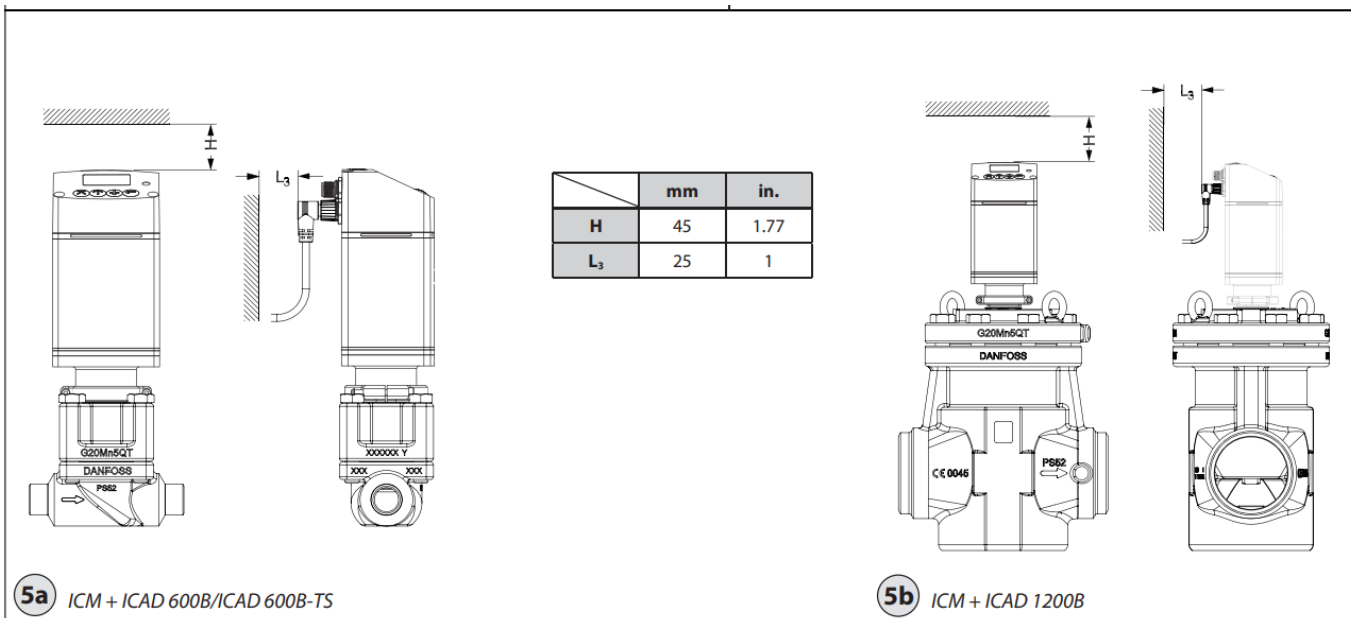
2



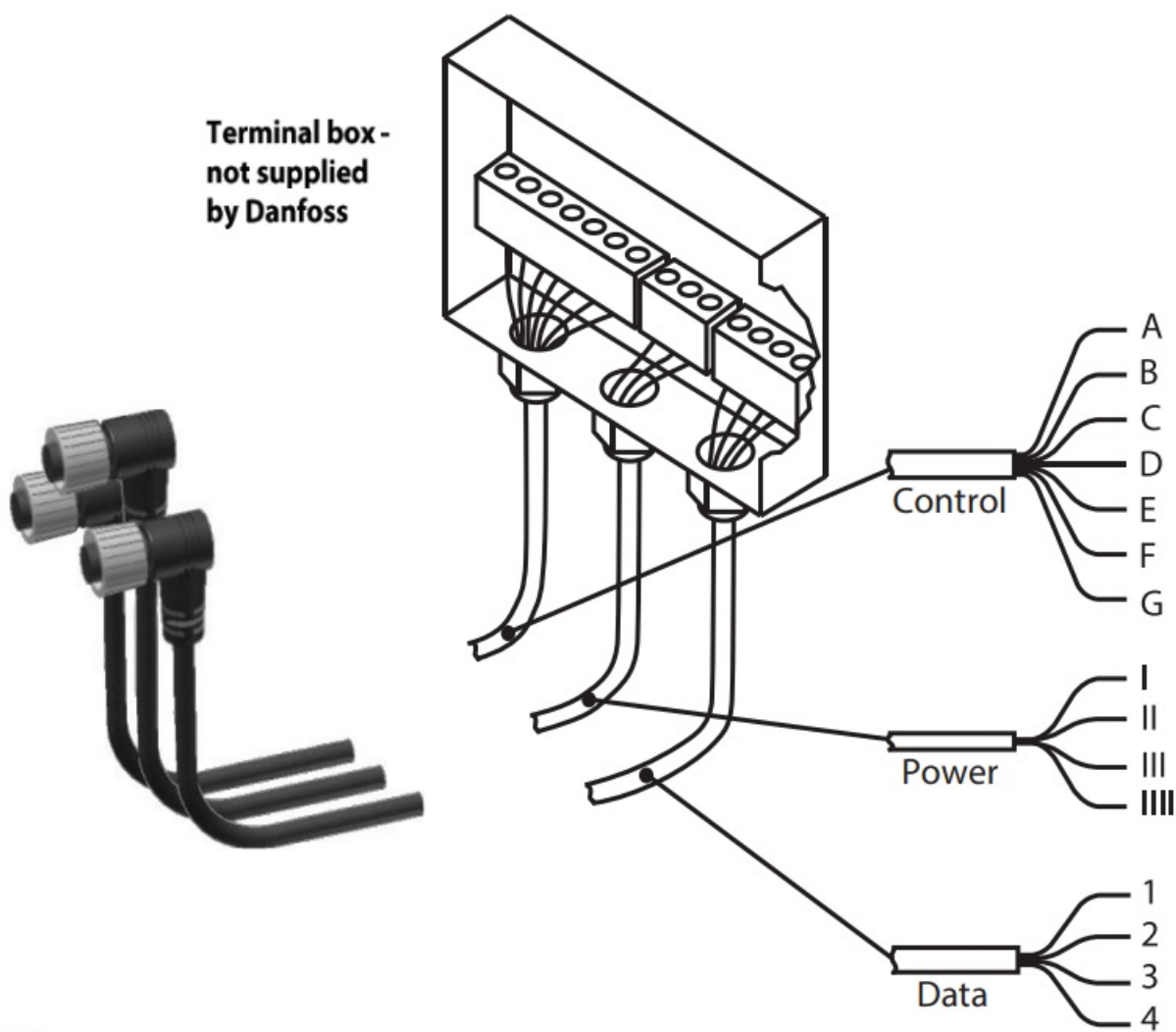
Before installing ICAD on ICM please read the separate guides "Mechanical installation of ICAD on ICM" and Quick start guide"

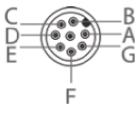
Nm	LB-feet
Max. 3	Max. 2.2




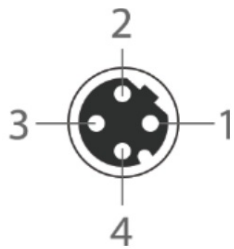


ICAD 600B / ICAD 600B / ICAD 1200B



ICAD back	Ref	Color		Description
	I	Black	+	Fail safe supply. Battery/ UPS* 19 V DC
	II	White	+	Supply voltage 24 V DC 2A, or more, per ICAD recommended ICAD PSU must be SELV**, >15 W
	III	Brown	–	
	IIII	Blue	+	UPS Signal of Health- optional depending on ID31: 'UPS supply' set to 'Yes'

	1	White/Blue	(-) / TX+	Data – (B) / Transmit Pair(+)
	2	White/Orange	GND / RX+	Ground / Receiving Pair(+)
	3	Blue	(+) / TX-	Data + (A) / Transmit Pair(-)
	4	Orange	GND / RX-	Ground / Receiving Pair(-)

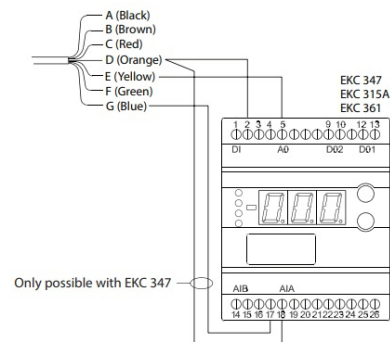
RS 485 / Ethernet RS 485 / Ethernet RS 485 / Ethernet				
	1	White/Blue	(-) / TX+	Data – (B) / Transmit Pair(+)
	2	White/Orange	GND / RX+	Ground / Receiving Pair(+)
	3	Blue	(+) / TX-	Data + (A) / Transmit Pair(-)
	4	Orange	GND / RX-	Ground / Receiving Pair(-)

*Uninterruptable Power Supply

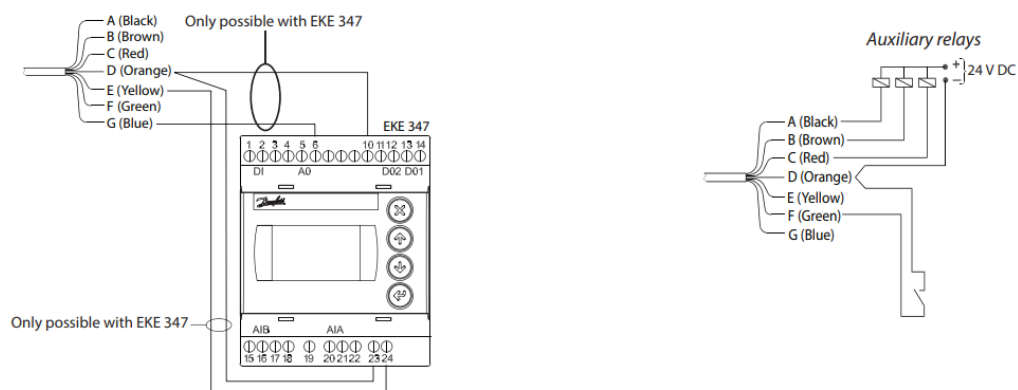
** The ICAD is a Class III appliance

ICAD 600B/1200B – Analog I/O for modulating control

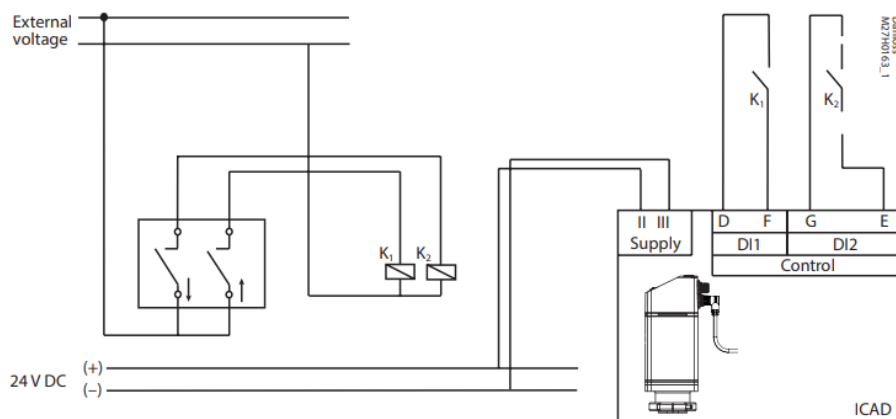
1. Control Cable
2. Power supply cable
3. Data cable



ICAD 600B/600B-TS/1200B – Digital I/O for ON/OFF valve operation



Neutral zone/3 points control



Installation

Do not install ICAD before welding. This apply for electrical as well as for mechanical installation. Please observe that ICAD when connected to 24 V DC, will send out acoustic noise at stand still. This has no influence on the function/ operation of the ICAD.

Use

ICAD 600B, ICAD 600B-TS and ICAD 1200B can be used together with the following Danfoss valves (fig. 1, 5a and 5b).

ICAD 600B	ICAD 600B-TS	ICAD 1200B
ICM 20	ICMTS 20	ICM 40
ICM 25	ICMTS 50	ICM 50
ICM 32	ICMTS 80	ICM 65
		ICM 100
		ICM 125
		ICM 150
		CVE pilot valve

Electrical data

Supply voltage is galvanically isolated from in-/output.

ICAD is a Class III product.

PSUs connected to ICAD must be SELV<100 VA

For UL compliance:

PSU must be Class 2 NEC

Control type: Operating Control – Type

1 Action

Pollution Degree: 3

Supply voltage

24 V DC (Tolerances; see below table)

Load ICAD 600B, ICAD 600B-TS : 1.2 A

ICAD 1200B: 2.0 A

24 Volt DC ONLY



Please observe cable voltage drop.

Distance between the applied DC transformer and the ICAD terminal box may cause a voltage drop. Cross section of cables and size of DC transformer must be calculated so that the voltage at all time **at the ICAD terminal box***, both during standstill and during operation of ICAD, is within this range:

Prefabricated ICAD cable length Code number		1.5 m 027H0426	3 m 027H043 8	10 m 027H04 27	15 m 027H0435
Voltage ICAD terminal (600B/1200B) [V DC]	Min.	21	22	23	24
	Max.	26.4			

*Do not measure inside the ICAD itself (value can be checked in ICAD B menu).

Fail safe supply

24 V DC (Tolerances; see table above)

Load ICAD 600B, ICAD 600B-TS: 1.2 A ICAD 1200B: 2.0 A

Data communication

RS 485: It is important that the installation of the data communication cable is done correctly. For further guidance, see literature No. RC8AC902.

Remember termination at the bus termination. Max length of cable: 1200 m with specific cable and limited data rate. Follow RS485 standard.

Insulation from power supply input, metallic part and interface output : 500 V DC: *For input/output connections

Analog Input – Current or Voltage Current

Input range: 0/4 – 20 mA

Max input range: 0 – 24 mA

Input resistance: 120 W + diode voltage 0.7 V DC

Measurement error: <±1.5% of the full scale

Reverse polarity protection: yes

Overcurrent protection: yes

Voltage

Input range: 0/2 – 10 V DC

Max input range: 0 – 12 V DC

Measurement error: <±1.5% of the full scale

Reverse polarity protection: yes

Analog Output

Output range: 0/4 – 20mA

Load: <800 W

Output error: <±1.5% of the full scale

Recommended external resistor for Hot application: Rext=800 W-load 1W power rate

Digital Input – Digital ON/OFF input by means of volt free contact (Signal/Telecom relays with gold-plated contacts recommended) – Voltage input used

Rth rise(OFF): >10 kΩ

Rth fall(ON): < 45 Ω

Digital Output – 3 pcs. NPN transistor output

External supply: 7 – 24 V DC (same supply as for ICAD can be used, but please note that the galvanically isolated

system will then be spoiled).

On resistance: 55 W + diode voltage 0.7 V DC Max 70 W at 50 mA

Max Output current: 50 mA

Reverse polarity protection: Yes

Overcurrent protection: No

Temperature range (ambient)

-30 °C/+50 °C (-22 °F/122 °F)

Enclosure

IP67 (~NEMA 6)

Electrical connection

Connection to ICAD is done via M12 connectors. ICAD has two M12 male and one M12 female connectors build-in:

Power supply: 4 poled M12 male connector

Control signals: 8 poled M12 male connector

Data communication: 4 poled M12 female connector

Power Supply cable with 4 poled M12 female connector

4 x 0.34 mm²

(4 x ~22 AWG) (fig. 6)

I: Black (+) 19 – 24 V DC fail safe supply (optional)

II: White (+) 24 V DC

III: Brown (–) 24 V DC

IIII: Blue (+) UPS signal of health

Control cable with 8 poled M12 female connector 7 x 0.25 mm² (7 x ~24 AWG) (fig. 7)

A: Black (–) Digital output Common Alarm

B: Brown (–) Digital output ICM fully open

C: Red (–) Digital output ICM fully closed

D: Orange (–) GND – Ground

E: Yellow (+) Analog input 0/4 – 20 mA)

F: Green (+) Analog input 0/2 – 10 V / DI1 – Digital ON/OFF input.

G: Blue (+) Analog output 0/4 – 20 mA)

Data communication cable with 4 poled M12 male connector: RS 485 / RS 485 /

Ethernet Ethernet

1: White/Blue (–) / TX+ Data – (B) / Transmit Pair(+)

2: White/Orange GND / RX+ Ground / Receiving Pair(+)

- 3: Blue (+) / TX- Data + (A) / Transmit Pair(-)
4: Orange GND / RX- Ground / Receiving Pair(-)

Electrical installation

General procedure for ICAD 600B/ICAD 600B-TS/1200B installed on all ICM, ICMTS & CVE valves.
All necessary electrical connections to be made.

Fig. 6

- Analog operation – 7 wired cable (A-G)
Modulation control. Valve to be controlled from Danfoss electronics, type EKC/EKE (g. 7), or third party electronics (like e.g. PLC).
 - Connect analog input signals. Current (mA) or Voltage (V). See Parameter list for configuration of analog input signals
 - Yellow (+) and Orange (GND) are used for current (mA) input **or**
 - Green (+) and Orange (GND) are used for Voltage (V) input
 - Blue (+) and Orange (GND) are used for current (mA) output (optional, not mandatory)

Fig. 6

- Digital operation – 7 wired cable (A-G)
ON/OFF ICM solenoid valve operation. ICM valve to be controlled by means of a digital volt free contact.
 - Connect digital input signals (fig. 8). See **Parameter list** for configuration of digital input signals
 - Green (+) and Orange (GND) are connected to a volt free contact
 - Digital output signals are optional, not mandatory.
 - Black (–) and Orange (GND) are connected to auxiliary relay for Common Alarm
 - Brown (–) and Orange (GND) are connected to an auxiliary relay indicating ICM fully open
 - Red (–) and Orange (GND) are connected to an auxiliary relay indicating ICM fully closed
- Supply voltage – 4 wired cable(I, II, III, IIII)
ICAD must be connected to a normal 24 V DC supply. As an option, a fail safe supply is possible by means of a battery or UPS (Uninterruptible Power Supply). When voltage is applied as described below, ICAD is ready to be configured.
See Parameter list.
ICAD configuration can be done independently whether the ICAD is installed on the valve or not. See Mechanical installation.
- Connect the White (+) and Brown (–) to 24 V DC supply voltage (fig. 6)
Fail safe supply as an option (not mandatory).
- Connect the Black (+) and Brown (–) to a fail safe supply.

Mechanical installation

General procedure for ICAD 600B/ICAD 600B-TS/1200B installed on all valves (fig. 3).

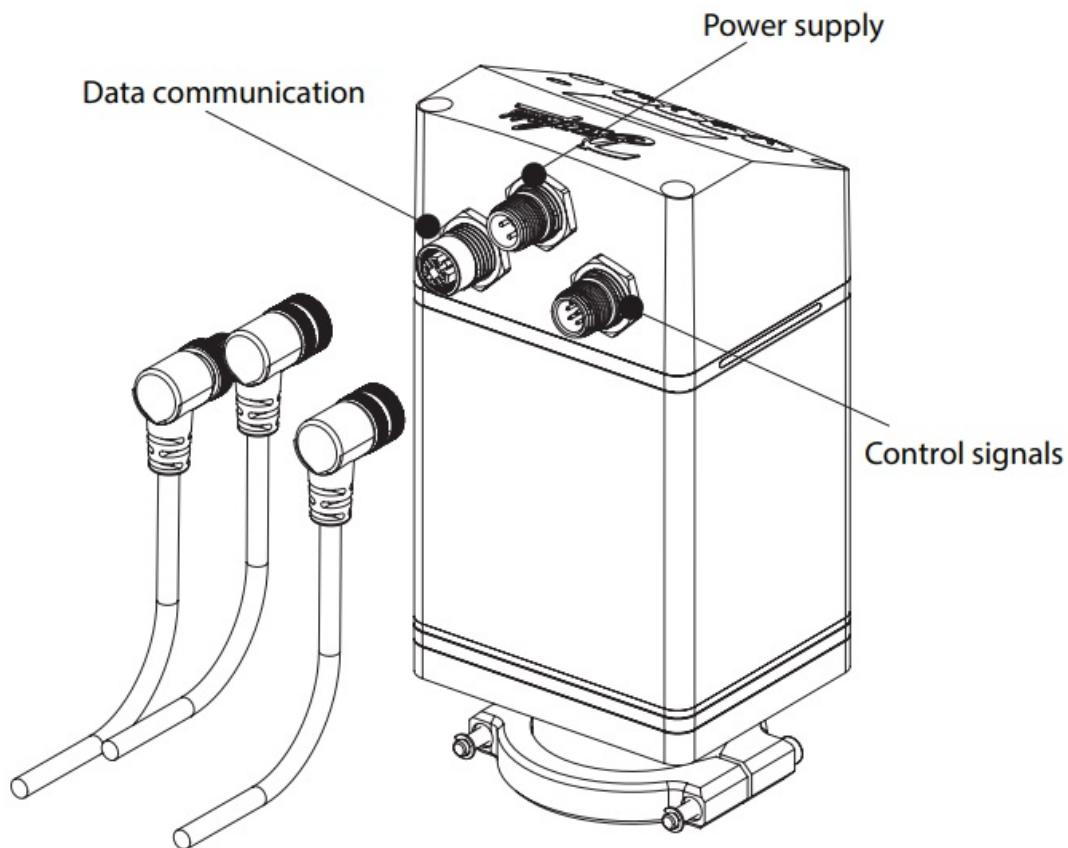
- Check that the two socket screws are fully unscrewed counter clockwise with a 3 mm Hexagon key
- If valve is attended with PTFE ring and O-ring, remove both and replace it with O-ring included in ICAD (as instructed in g. 3)
- Mount ICAD by slowly lowering it on top of the valve.
- The magnet coupling will drag the valve and ICAD together and in position
- Push ICAD in place
- Fasten valve and ICAD with the two socket set screws using a 3 mm Hexagon key








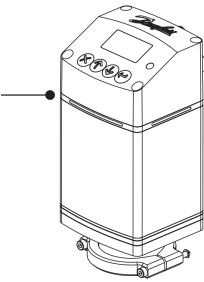
Special moisture seal is damaged if screws are removed (fig. 3).

Power on & start operation

ICAD has a light guide viewable from three sides, which indicates the status. Immediately after power on the light guide and display lights up.



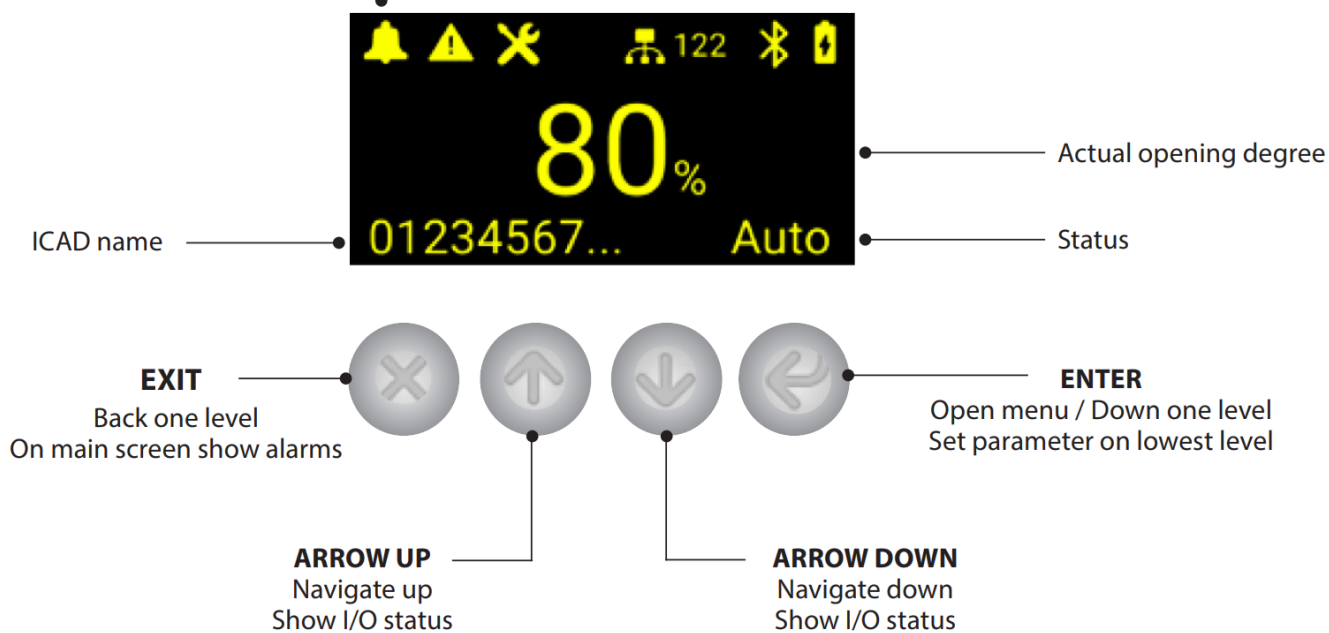
	Steady red	Critical alarm – stopped operating
	Flashing red	Severe alarm – danger of stopping o perating
	Flashing blue	ICAD is connected via Bluetooth
	Flashing yellow	Warning
	Flashing green	OK



The main screen layout and navigation is as described below. ICAD will start up in alarm mode as the ICM configuration needs to be defened to start operation. Follow the steps on next page to set this up correctly.

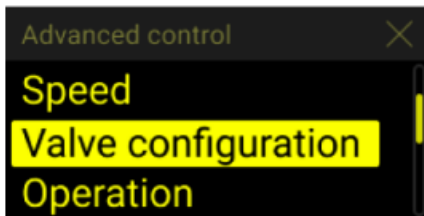
STATUS BAR

Alarm | Warning | Service overdue | Modbus address | Bluetooth ON | UPS enabled

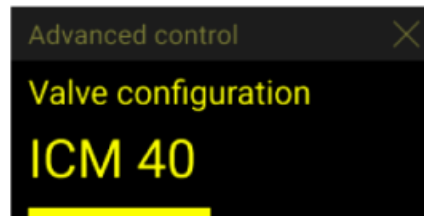


Set valve (A1 alarm)





Navigate to **Valve configuration** using ↓, then press enter ↵



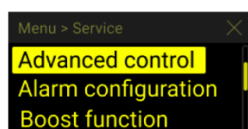
Select the ICM size or CVE. Press enter ↵ to set, and you will be navigated back to the previous screen. Continue to next step or press X to get back to main screen

VALVE CONFIGURATION HELP

ICAD 600B		
- ICM 20	—	
- ICM 25	}	
- ICM 32		
ICAD 1200B	—	
- ICM 40	}	
- ICM 50		
- ICM 65		
- ICM 100		
- ICM 125	—	
- ICM 150	}	
- CVE		
ICAD 600B TS		
-ICMTS 20	}	
-ICMTS 50		
-ICMTS 80		

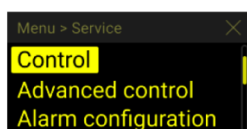
Change analog input signal (optional)

ICAD will function based on factory settings as soon as the valve configuration has been set. The default settings are Modulation using an analog input of 4–20 mA.

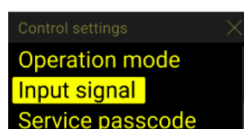


Navigate back from the advanced control menu using **X**

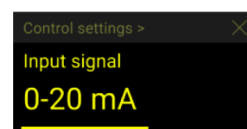
If starting from main screen press enter **↵** and navigate to the service menu like in previous step.



Now navigate to **Control** in the service menu using **↑**, then press enter **↵**



Next navigate to **Input signal** in the service menu using **↓**, then press enter **↵**



Select the desired input signal. Press enter **↵** to set, and you will be navigated back to the previous screen.

Press **X** to get back to main screen

Bluetooth connection

In addition to the onboard display, all configuration and readings from ICAD B actuator can be performed via Bluetooth (using Coolcong mobile app) or via data communication.

CoolConfig can be downloaded and installed from iTunes Store or Google Play Store.

To connect with ICAD actuator, click Start scanning in CoolConfig and the list of available devices will be provided.

To connect with a device, a password will be required.

The connection PIN is 0000 and serves to ensure that the connection is intentionally. Access is then read-only.

Further languages and documentation



www.icadb.danfoss.com

DanfossA/S

Climate Solutions

danfoss.com

+45 7488 2222

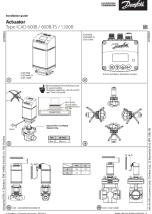
Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, on line or via download, shall be

considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material.

Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.



Documents / Resources

	<p>Danfoss ICAD 600B Motorized Valve Control [pdf] Installation Guide ICAD 600B, ICAD 600B-TS, ICAD 1200B, ICAD 600B Motorized Valve Control, ICAD 600B, Motorized Valve Control, Valve Control, Control</p>
---	--

References

- [Danfoss ICAD B Motorized valve control | Danfoss](#)
- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.