

Data Sheet

Motor operated valve Type **ICMTS** with actuator Type **ICAD 600B-TS**

Designed to regulate the flow of transcritical gas or subcritical liquid from the gascooler in transcritical CO₂ systems



The ICMTS is a direct operated motorised valve driven by actuator type ICAD 600B-TS. The ICMTS is designed to regulate the flow of transcritical gas or subcritical liquid from the gascooler in transcritical CO₂ systems. The ICMTS can also be used for other control functions in CO₂ systems. The ICMTS valve is designed so that the opening and closing forces are balanced.

ICAD actuator can be controlled in multipleways:

- Using the following signals:
 - 0–20 mA/4–20 mA
 - 0–10 V/2–10 V
- By a digital input (on-off)
- Via data communication:
 - Modbus RTU (RS485)/Modbus TCP/IP (Ethernet)

ICAD 600B-TS actuators can also operate an ICMTS valve as an On/Off function supported by a digital input.

The ICMTS valve can be operated manually via the ICAD 600B-TS actuator or via the Multi-function tool for ICMTS (see the [Ordering](#)).

The actuator type 600B-TS is designed specifically for ICMTS valves.

ICAD B-TS incorporates an advanced MMI (Man Machine Interface) display with descriptive text and icons, which gives the user a very intuitive, advanced and flexible set up procedure that can meet different applications. In addition to the display interface, ICAD B also incorporates Bluetooth communication to a mobile app and data communication, which give the user alternative Interfaces for optimal efficiency and convenience when setting up an ICAD B.

Features

Valves

- Designed for high pressure CO₂ systems with applications for a maximum working pressure of 140 bar / 2030 psig.
- Applicable to R744 (CO₂)
- Direct coupled connections
- Connection types are DIN butt weld, ANSI butt weld, DIN brazing and ANSI brazing
- Non-alloyed quality steel
- Compact design
- Regulating cone ensures optimum regulating accuracy, particularly at part load
- Manual opening possible via ICAD 600B-TS or Multi-function tool
- The PTFE seat provides excellent valve tightness
- Magnet coupling - real hermetic sealing
- ICAD 600B-TS include encoder function that will provide a true valve position feedback to Danfoss controller or non-Danfoss control systems.

Actuator

- Specifically designed for ICMTS valve
- Advanced and high speed Digital Stepper Motor Technology
- Additional micro steps to provide more precise control
- High contrast LCD display and user friendly navigation keyboard
- Valve opening degree can be observed continuously
- Data connection via RS485 or Ethernet
- In addition to the onboard display, all configuration and readings from ICAD B actuators can be performed via Bluetooth (using Coolconfig mobile app) or via data communication
- Can easily be configured to different applications on-site. (change speed, ON/OFF, modulating valve)
- Open – Close time: 3 seconds
- Automatic Autodetection of valve size
- Quick Set up wizard
- Modulating or ON/OFF operation
- Multiple speed selection during operation
- Logging of all events, warnings and alarms
- Password protection
- Multiple control options: Analog signals (0–20 mA, 4–20 mA, 0–10 V, 2–10 V), digital signal (On-off) and data communication (RS485 & Ethernet)
- Position feedback: Signals (0–20 mA , 4–20 mA) and Data communication (RS485 & Ethernet)
- 3 digital ON/OFF feedback
- Resolution: 20 micron/step (0.02 mm stroke pr. step)
- Total steps: 250 for ICMTS 20, 600 for ICMTS 50/80
- Auto Calibration, Neutral zone
- In the event of a power failure, multiple fail safe options are possible. During power failure, ICAD 600B-TS can be selected to:
 - Close ICMTS
 - Open ICMTS
 - Stay in the position it was in, prior to power failure. Go to a specific ICMTS valve opening degree.
- Hermetic magnetic motor
- New design of hermetic flange connection to secure highest reliability of magnet coupling
- Enclosure: IP 67 (~NEMA 6)
- Approvals: CE, UL, CRN
- Connectors for easy installation and servicing

Function

ICMTS valve

The ICMTS motor valve is designed for use with ICAD 600B-TS.

The driving force from the actuator is transferred via a magnetic coupling (a) through the stainless steel top housing (b), thus eliminating the need for a packing gland. The rotational movement of the magnetic coupling (a) is transferred to a spindle (c) which in turn provides the vertical movement of the cone (d) and PTFE valve plate (e), to open and close the valve. The closing force of the actuator combined with the PTFE valve plate (e) provides an effective seal to prevent leakage across the valve port, when the valve is in the closed position. To prevent damage to the PTFE valve plate (e) from system debris, it is recommended to install a filter in the system.

Valve inlet pressure (P1) acting on the underside of the PTFE valve plate (e) also passes through the hollow cone assembly in ICMTS 20 (d) on to the top of the piston (g) or the bore in the piston of ICMTS 50/80 (d) and balances the pressure acting on the piston. Any trapped liquid across the throttle cone (d) is equalised down to the valve outlet without affecting the valve performance.

Figure 1: ICMTS 20

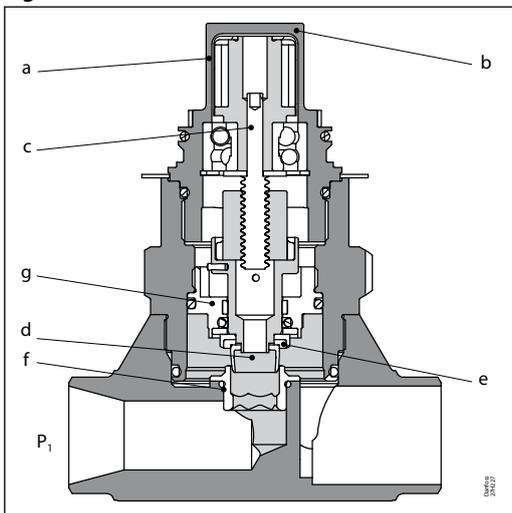
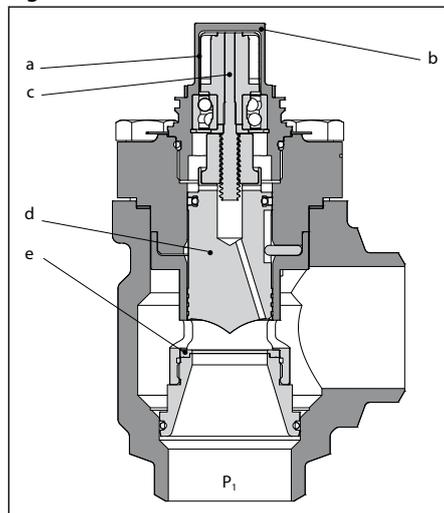


Figure 2: ICMTS 50/80



The actuators have a fully weather protected enclosure with none of the moving parts exposed to the environment.

The fast acting actuators and balanced valve design results in the valve being able to move from the fully closed to the fully open position in about 3-9 seconds.

The smallest cones in ICMTS 20 (A33 and A) are log-shaped in order to provide optimum regulation at small capacities and high pressure differentials.

Bigger cones in ICMTS 20 (B and C) are V-shaped in order to provide an optimum regulating curve for higher capacities.

ICAD 600B-TS actuator

The design of ICAD 600B-TS is based on a digital stepper motor technology combined with an advanced MMI (Man Machine Interface), that gives excellent possibilities for having a high degree of flexibility with the same type of ICAD 600B-TS actuator.

The Opening Degree (0-100 %) of the actual ICMTS valve installed can be continuously observed on the ICAD 600B-TS display.

The advanced menu system will allow several parameters to be adjusted to obtain the required function.

Many different parameters can be configured, among these:

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

- Modulating and ON/OFF control
- Analogue input
 - 0 – 20 mA or 4 – 20 mA
 - 0 – 10 V or 2 – 10 V
- Analogue output
 - 0 – 20 mA or 4 – 20 mA
- Automatic or manual control
- Change of ICMTS valve speed
- Automatic calibration
- Multiple Fail Safe set-up options during power cut

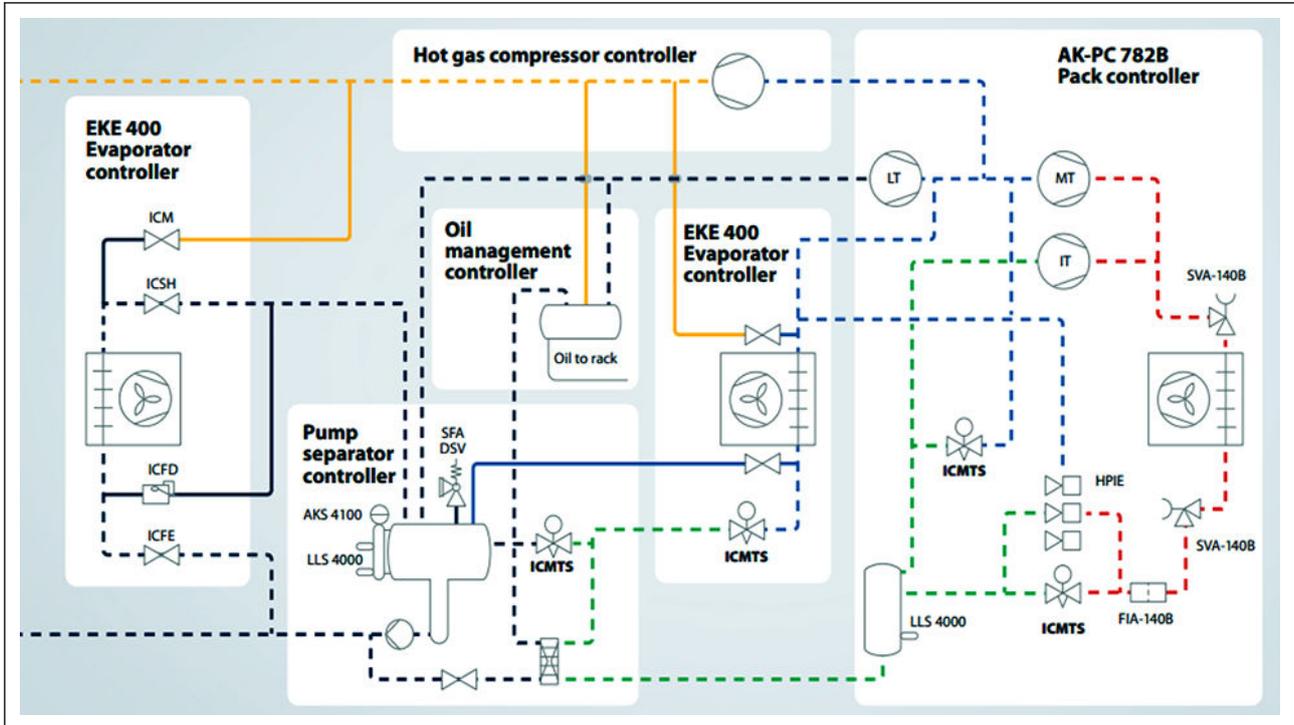
For service all Input and Output signals can be recalled and observed from the ICAD 600B-TS display.

A password protection has been linked to the parameter of entering the correct ICMTS valve to avoid unintentional and non-authorised operation.

Application

ICMTS valve

Figure 3: Application



The ICMTS valve is developed for transcritical CO₂ applications. The ICMTS valve can be used in systems with flash gas bypass, parallel compression as well as in stand-alone application. The ICMTS valve can be used in transcritical and subcritical conditions.

For ICMTS 50/80 applications it is recommended that the valve opening degree at the minimum operating conditions is greater than 10%.

Media

Refrigerants

Applicable to R744 (CO₂). ICMTS valves must not be used with flammable refrigerants. For further information, please contact your local Danfoss sales company.

New refrigerants

Danfoss products are continually evaluated for use with new refrigerants depending on market requirements.

When a refrigerant is approved for use by Danfoss, it is added to the relevant portfolio, and the R number of the refrigerant (e.g. R513A) will be added to the technical data of the code number. Therefore, products for specific refrigerants are best checked at store.danfoss.com/en/, or by contacting your local Danfoss representative.

Product specification

Technical data

ICMTS valve

Table 1: Technical data - Valve

Features	Specifications
Connections	ICMTS valves are available with DIN butt weld connections, ANSI butt weld, DIN brazing and ANSI brazing
Design	Valve body and top cover material
Temperature range	Allowable TS: -60/+150 °C (-76/+302 °F) Operation: -60/+120 °C (-76/+248 °F) for ICMTS 20 and -40/+50 °C (-40/+122 °F) for ICMTS 50/80 Ambient: -30/+50 °C (-22/+122 °F)
Pressure	Max. working pressure: 140 bar g (2030 psig)
MOPD	Max. opening pressure differential (MOPD)ICMTS: 90 bar (1305 psi)
Reaction time	The time it takes to move from Closed to Open position or in reverse order with maximum selected speed at ICAD 600B-TS is 3 seconds for ICMTS 20 and 9 seconds for ICMTS 50/80
Surface protection	The external surface is treated in order to provide good corrosion protection

ICAD 600B-TS actuator

Technical data

Table 2: Technical data - Actuator

Features	Specifications
Materials	Housing: Aluminium Top part of ICAD: PBT thermo plastic
Weight	ICAD 600B-TS: 1.73 kg (3.81 lb)
Temperature range (ambient)	-30 °C / +50 °C (-22 °F / 122 °F)
Enclosure	IP 67 (~NEMA 6)
Cable connection	Cables not included. To be ordered separately M12 connectors
Supply cable	4 × 0.34 mm ² (3 × ~22 AWG) Ø4.8 mm (diameter 0.19")
Control cable	7 × 0.25 mm ² (7 × ~24 AWG) Ø6 mm (diameter 0.24")
Data communication cable	4 × 0.08 mm ² (4 × ~26 AWG) Ø6 mm (diameter 0.24")

Electrical data

Table 3: Electrical connections

Features	Specifications
Electrical data	Supply voltage is galvanic isolated from Input/Output
Supply voltage	Load: 24 V DC (Tolerances; see Table 3) ICAD 600B-TS: 1.2 A
Fail safe supply	24 V DC (Tolerances; see Table 3) ICAD 600B-TS: 1.2 A
Analog input	Current: Input range: 0/4 – 20 mA Max input range: 0 – 24 mA Input resistance: 120 Ω + diode voltage 0.7 V DC Measurement error: <±1.5% of the full scale Reverse polarity protection: yes Overcurrent protection: yes
Analog output	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
Digital input	Output range: 0/4 – 20 mA Load: <800 Ω Output error: <±1.5% of the full scale
Digital input	Digital ON/OFF input by means of voltfree contact (Signal/Telecom relays with gold-plated contacts recommended) – Voltage input used Rth rise(OFF): >10 kΩ Rth fall(ON): < 45 Ω

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Features	Specifications
Digital output	3 pcs. NPN transistor output
	<i>External supply:</i> 7 – 24 V DC (same supply as for ICAD can be used, but please note that the galvanically isolated system will then be spoiled).
	<i>On resistance:</i> 55 Ω + diode voltage 0.7 V DC Max 70 Ω at 50 mA Max Output current: 50 mA Reverse polarity protection: Yes Overcurrent protection: No

Table 4: ICAD supply voltage tolerances

Prefabricated ICAD cable length	Code number	1.5 m	3 m	10 m	15 m
			027H0426	027H0438	027H0427
Voltage ICAD terminal [V DC]	Min.	21	22	23	24
	Max.	26.4			

Cable connection

Figure 4: Cable connection

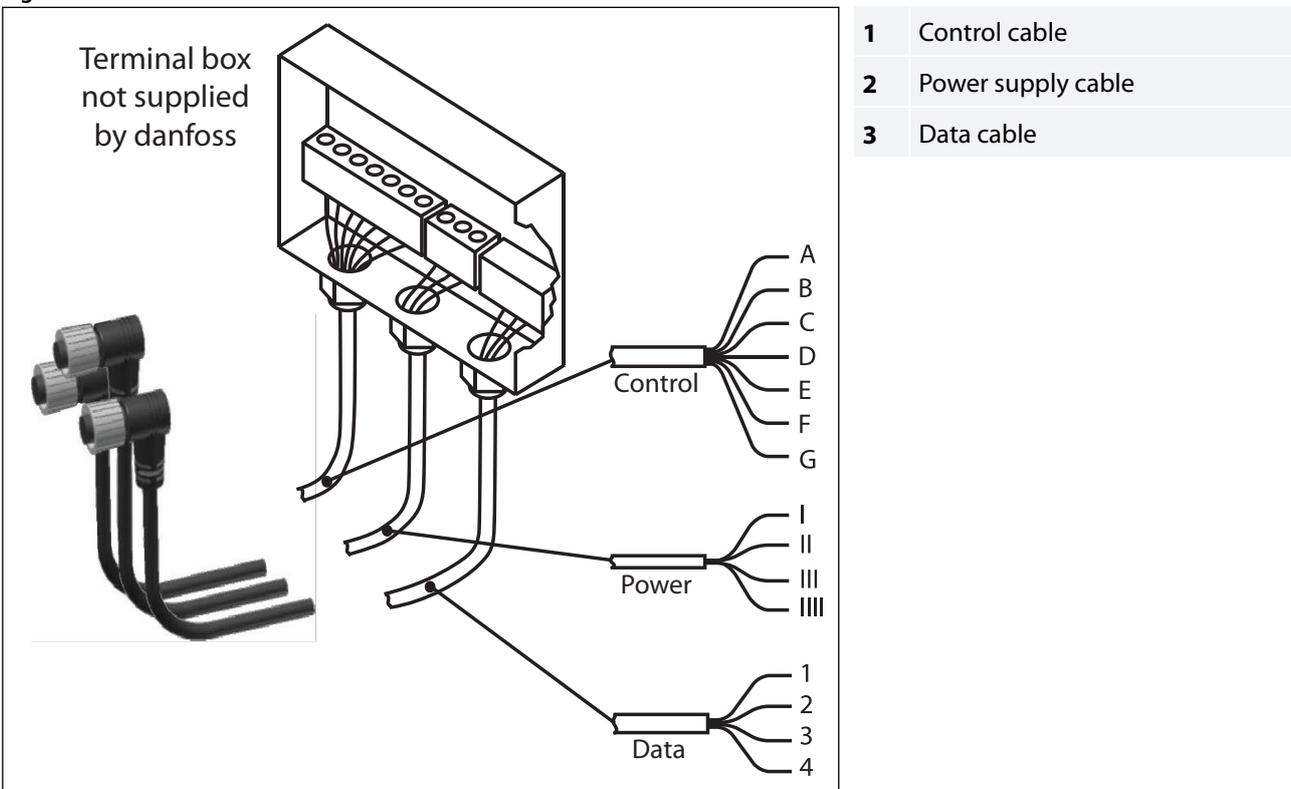


Figure 5: Cable Connectors - Rear view

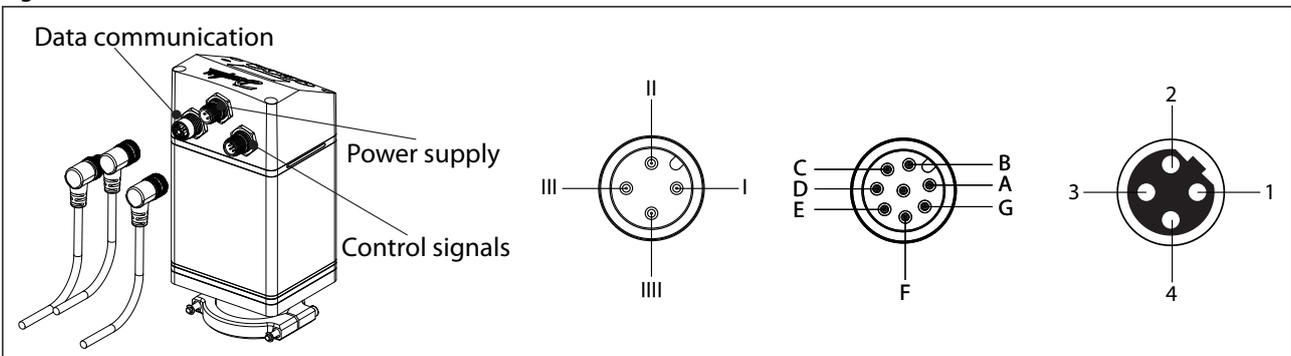
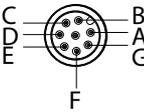
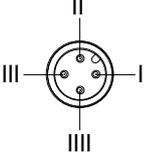
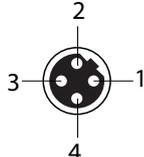


Figure 6: ICAD back Description

ICAD back	Ref	Color		Description
	A	Black	-	Common alarm
	B	Brown	-	ICM fully open
	C	Red	-	ICM fully closed
	D	Orange	-	GND ground
	E	Yellow	+	0/4 -20 mA Input
	F	Green	+	0/2 - 10 V input or digital input for on/off control
	G	Blue	+	0/4 - 20 mA Output
} Digital output				
	I	Black	+	Fail safe supply. Battery / UPS* 19 V DC
	II	White	+	Supply voltage
	III	Brown	-	24 V DC 2A, or more, per ICAD recommended ICAD PSU must be SELV**, >15 W
	IV	Blue	+	UPS Signal of Health - optional depending on ID31: 'UPS supply' set to 'Yes'
RS485/ 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

Fail Safe supply options

Figure 7: ICAD 600B-TS



In the event of a power failure, multiple fail safe options are possible, provided that a ICAD-UPS or similar is used.

During power failure, ICAD can be selected to:

- Close ICM/ICMTS
- Open ICM/ICMTS
- Stay in the position it was in, prior to power failure
- Go to a specific valve opening degree

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

See ICAD-UPS for ICM/ICMTS for further information.

i NOTE:

A fail safe supply (battery or UPS) is required.

Facts and features

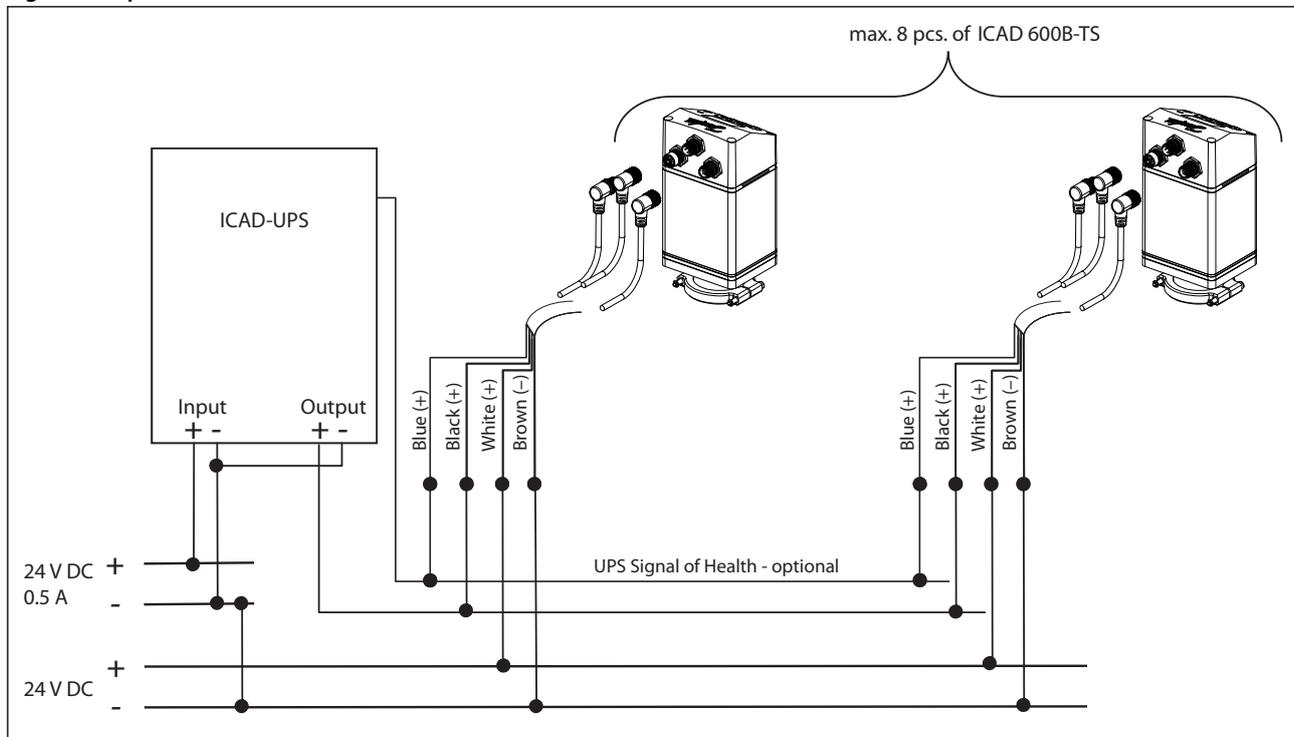
- Industrial product
- Can support up to 8 pcs of ICAD 600B-TS
- Integrated solution - battery and UPS
- Industrial approvals: CE, UL, GL (Germanischer Lloyd)
- DIN rail mounting
 - LED indication
 - Green (Power ON)
 - Yellow (Flashing: charging, Constant: Buffer mode (Failsafe supply to ICAD 600B- TS))
 - Red (Battery fully discharged/Battery faulty)
- 24 V DC supply → Same transformer as for ICAD 600B-TS can be used. Only +0.5 A extra load on the transformer
- Check of battery every 60 sec
- Adjustable buffer time⁽¹⁾. (1, 2, 3, 5, 10, 15, 20, 30 or infinity) = Ensures longer battery life time
- Forced remote shutdown in buffer mode via digital input
- 3 digital volt free relay change over contacts for signals to PLC systems. (Power OK, Buffer mode (failsafe supply to ICAD), Alarm)

Code number: **027H0388**

For further information, please refer Instruction guide - [AN000086416706](#).

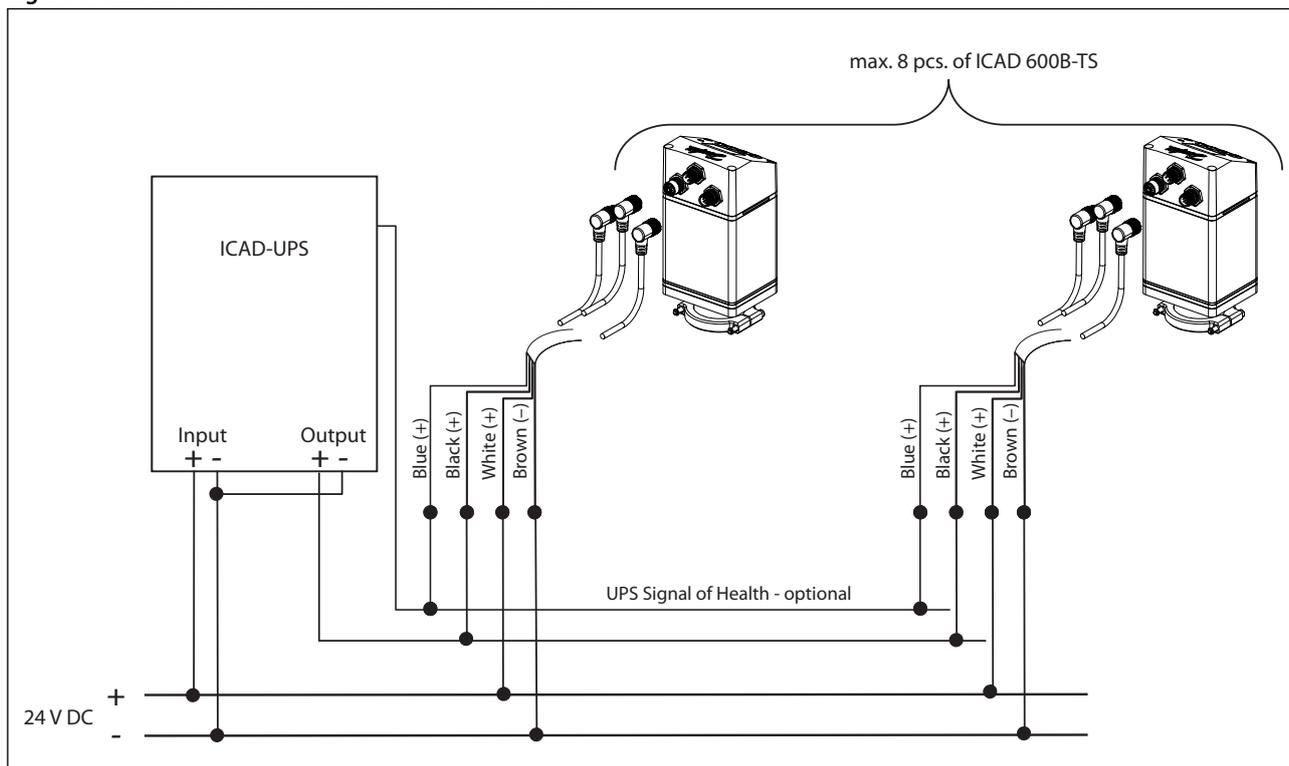
Applications

Figure 8: Separate 24 V DC tranformer for both ICAD-UPS and ICAD



¹ Buffer time is defined as the period where ICAD is only powered from the ICAD-UPS (i.e. not from main supply). On ICAD-UPS there is an adjustable buffer time setting (1, 2, 3, 5, 10, 15, 20, 30 min. or infinity). If set to 3, ICAD-UPS will switch off power to connected ICAD 600B-TS, 3 minutes after the power failure occurs. This ensures that the internal battery inside ICAD-UPS does not fully discharge

Figure 9: One 24 V DC transformer for ICAD-UPS and ICAD



ICAD-UPS for ICMTS

Figure 10: ICAD-UPS



ICAD-UPS is designed for using with ICM and ICMTS valves.

In the event of power failure, there is a need to make sure that the ICM/ICMTS goes to a safe position. ICAD-UPS can be connected to the ICAD.

The solution of connecting ICMTS with ICAD to ICAD-UPS will give one of the following possibilities in the event of power failure:

- close ICM/ICMTS
- open ICM/ICMTS
- stay
- go to a specific ICM/ICMTS Opening Degree

When power supply has been re-established the system will automatically return to normal operation.

Material specification

Figure 11: ICMTS 20

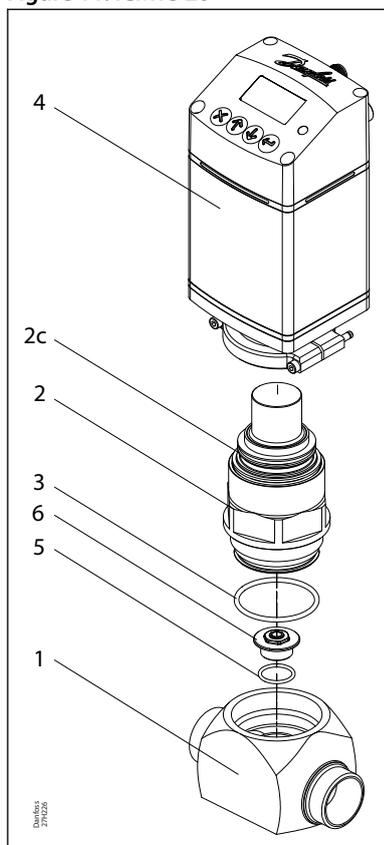


Table 5: Material specification

No.	Part	Material	EN	ASTM
1	Housing	Low temperature steel	S235J2, EN10025	A515
2	Top cover / function module	Low temperature steel	S355J2, EN10025	LCC, A352
2c	O-ring	Chloroprene (Neoprene)		
3	O-ring	Chloroprene (Neoprene)		
4	Actuator			
5	O-ring	Chloroprene (Neoprene)		
6	Seat	Stainless steel		

Figure 12: ICMTS 50/80

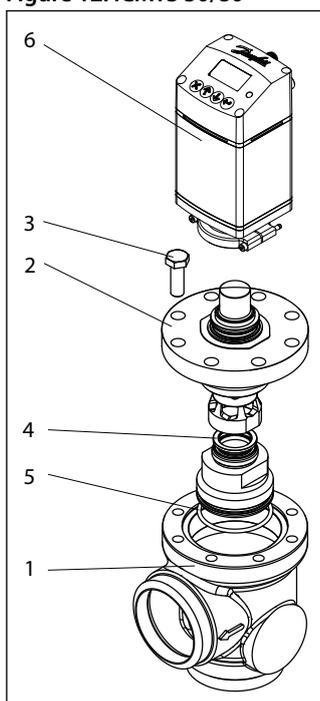


Table 6: Material specification ICMTS 50/80

No.	Part	Material	EN	ASTM
1	Housing	Low temperature steel	S235J2, EN10025	A515
2	Top cover	Low temperature steel	S355J2, EN10025	LCC, A352
3	Bolt	42CrMo4+QT DIN 933 Grade 8.8		
4	Seat	PTFE		
5	O-ring	EPDM		
6	Actuator			

ICMTS capacities

It is relatively complex to correctly size a valve for transcritical applications, especially as the mass flow of the refrigerant changes, drastically moving from transcritical to subcritical conditions. At the same time, temperature variations in the intermediate vessel downstream of the valve, will not significantly affect the sizing the valve.

It is recommended to calculate the ICMTS valve using Danfoss **Coolselector^{®2}**. Quick capacity selection could be done using the following tables.

ICMTS 20

It is recommended to calculate the ICMTS valve using Danfoss Coolselector software following these steps:

- Calculate the ICMTS valve as an expansion valve in the liquid line with the following conditions: $T_{cond} = +30\text{ }^{\circ}\text{C}$, T_{evap} = temperature in the intermediate vessel, 0 K subcooling
- Check the selected valve for the winter conditions: e.g. $T_{cond} = +15\text{ }^{\circ}\text{C}$ with 5 K subcooling
- Possible part load of the system at $T_{cond} = +30\text{ }^{\circ}\text{C}$, T_{evap} = temperature in the intermediate vessel, 10 K subcooling. (night operation or the smallest capacity step of the power pack). The part load of the valve should be above 10%.

Quick capacity selection could be done using the following table:

Table 7: 0 K subcooling in the subcritical mode

	+15/+5 °C [kW]	+30/+5 °C [kW]	+38 (100 bar)/ +5 °C [kW]
ICMTS 20-A33	16.7	16.1	25
ICMTS 20-A	50	48	75
ICMTS 20-B	291	278	423
ICMTS 20-C	479	454	675

Table 8: 5 K subcooling in the subcritical mode

	+15/+5 °C [kW]	+30/+5 °C [kW]	+38 (100 bar)/ +5 °C [kW]
ICMTS 20-A33	18.5	23	25
ICMTS 20-A	56	69	75
ICMTS 20-B	325	400	423
ICMTS 20-C	540	655	675

Table 9: 10 K subcooling in the subcritical mode

	+15/+5 °C [kW]	+30/+5 °C [kW]	+38 (100 bar)/ +5 °C [kW]
ICMTS 20-A33	20.4	26.5	25
ICMTS 20-A	61	80	75
ICMTS 20-B	355	470	423
ICMTS 20-C	585	760	675

ICMTS 50/80

Table 10: Capacity range High Pressure expansion valve

	⁽¹⁾ [kW]
ICMTS 50	1485
ICMTS 80A	2970
ICMTS 80B	4500

⁽¹⁾ Pgascooler 90 bar / Tgascooler +35 °C / Tevap -10 °C / Preceiver 36 bar

Table 11: Capacity range Gas Bypass valve

	⁽¹⁾ [kW]
ICMTS 50	648
ICMTS 80A	1296
ICMTS 80B	1944

Dimensions and weights

ICMTS 20

Figure 13: ICMTS 20

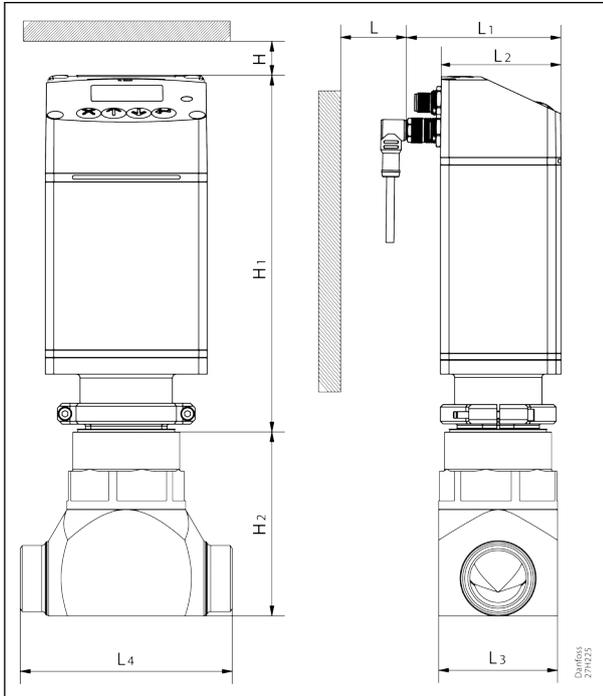


Table 12: ICMTS 20

Connection		H	H ₁	H ₂	L ⁽¹⁾	L ₁	L ₂	L ₃	L ₄	Weight ICMTS incl. ICAD 600B-TS
25 D (1 in.)	mm	45	195	94	65	86	68	60	107	3.3 kg
	in.	1.77	7.68	3.7	2.56	3.39	2.68	2.36	4.21	6 lb.

⁽¹⁾ Include space for ICAD Protection cap.

NOTE:

Weight is approximated only.

ICMTS 50/80

Figure 14: ICMTS DN 50

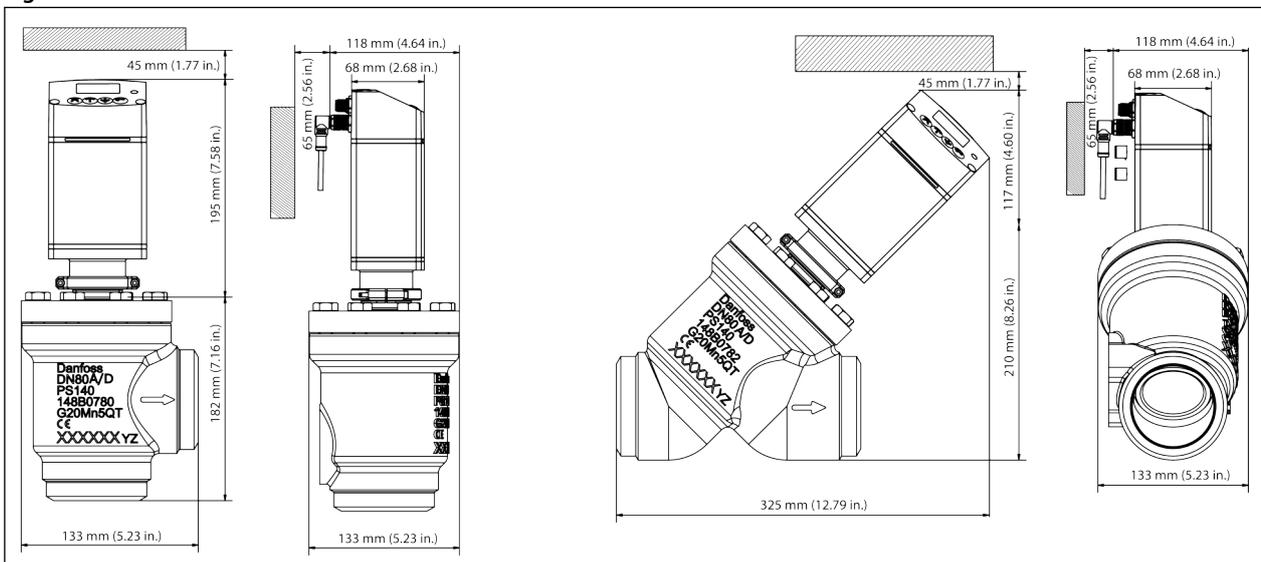
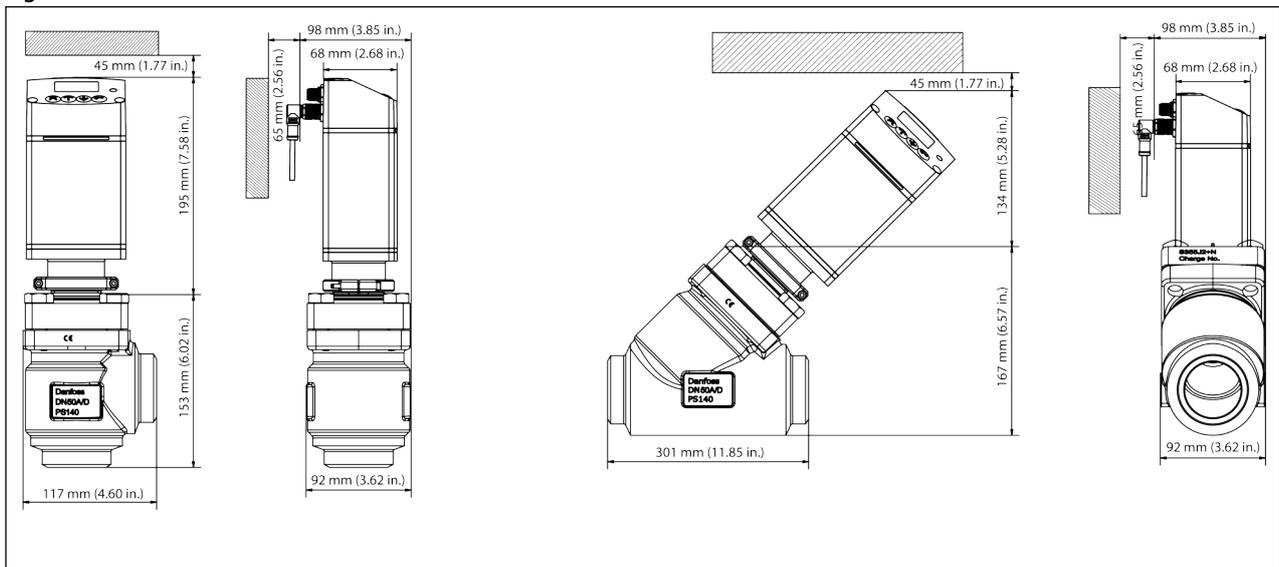


Figure 15: ICMTS DN 80



Connections

ICMTS 20

Figure 16: Butt weld DIN (EN 10220)

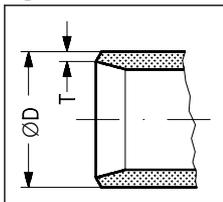


Table 13: Butt weld DIN (EN 10220)

Size mm	Size in.	OD mm	T mm	OD in.	T in.
25	-1	33.7	2.6	1.327	0.103

ICMTS 50/80

There is a wide range of connection types and sizes available with ICMTS 50/80 valves:

- **D**: Butt weld, DIN (EN 10216-2)
- **A**: Butt weld, ANSI (ASME B 36.10M SCHEDULE 80)
- **SA**: Brazing ASME (ASME B16.50)
- **SD**: Brazing DIN (DIN EN 1254-5)

Figure 17: Butt weld DIN (EN 10216-2)

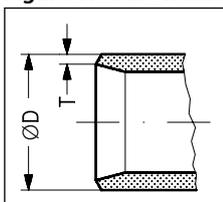


Table 14: Butt weld DIN (EN 10216-2)

Size mm	Size in.	ØD mm	T mm	ØD in.	T in.
50	2	60.3	5	2.37	0.20
80	3	88.9	7.1	3.5	0.28

Figure 18: Butt-weld ANSI

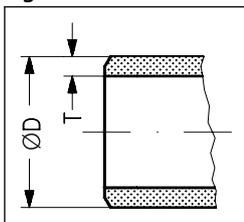


Table 15: A: Butt-weld ANSI (B 36.10)

Size	Size	ØD	T	ØD	T	Schedule
mm	in.	mm	mm	in.	in.	
50	2	60.3	5.6	2.37	0.22	80
80	3	88.9	7.6	3.5	0.30	80

Figure 19: SD: Brazing

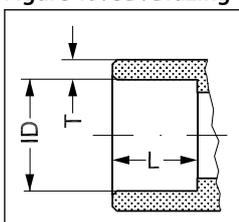
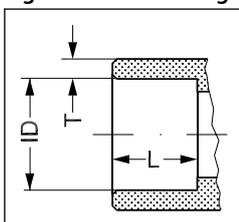


Table 16: SD: Brazing (DIN EN 1254-5)

Size	ID	L
mm	mm	mm
54	54.09	33

Figure 20: SA: Brazing

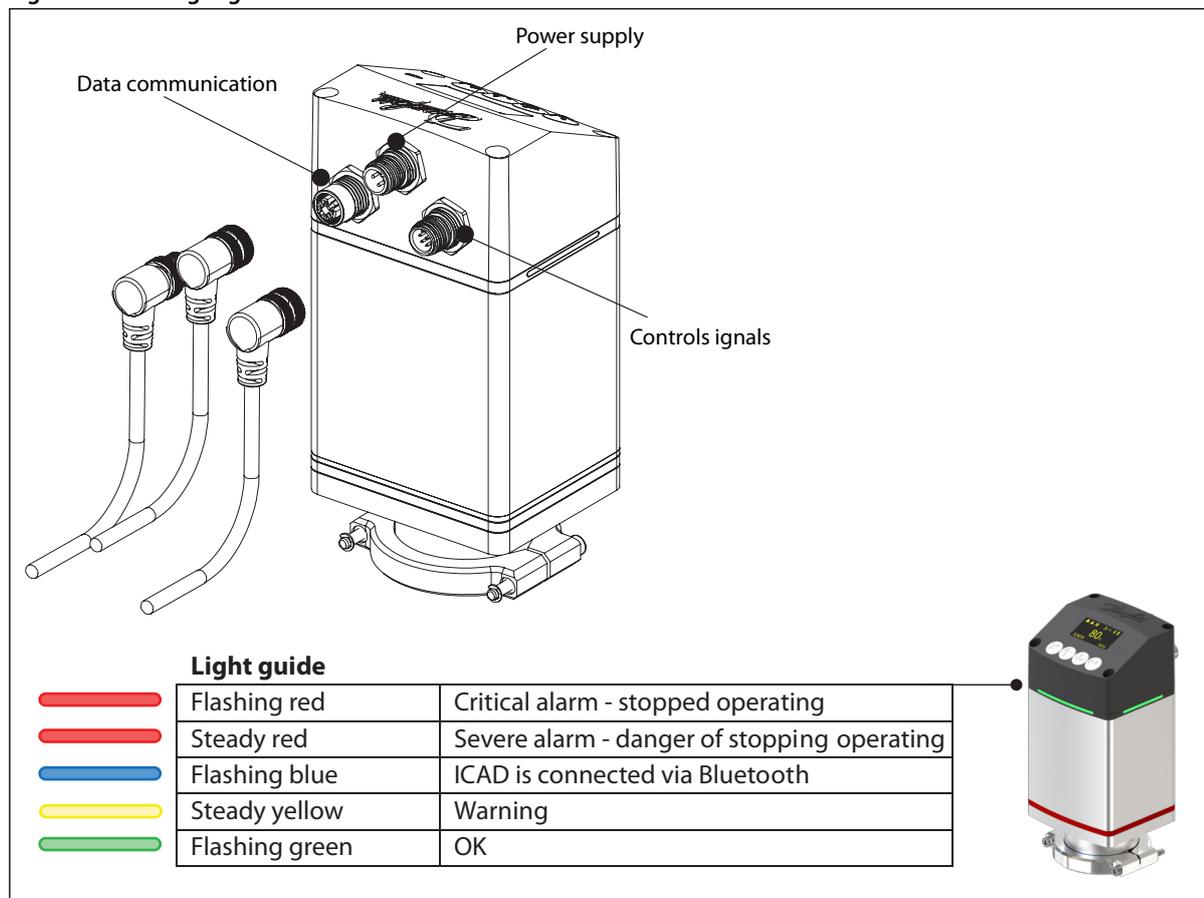


General operation

ICAD light guide

In addition to the onboard display, ICAD B is equipped with an status light guide visible from different angles. The light guide provides a continues status of ICAD B operation in real time.

Figure 21: ICAD light guide

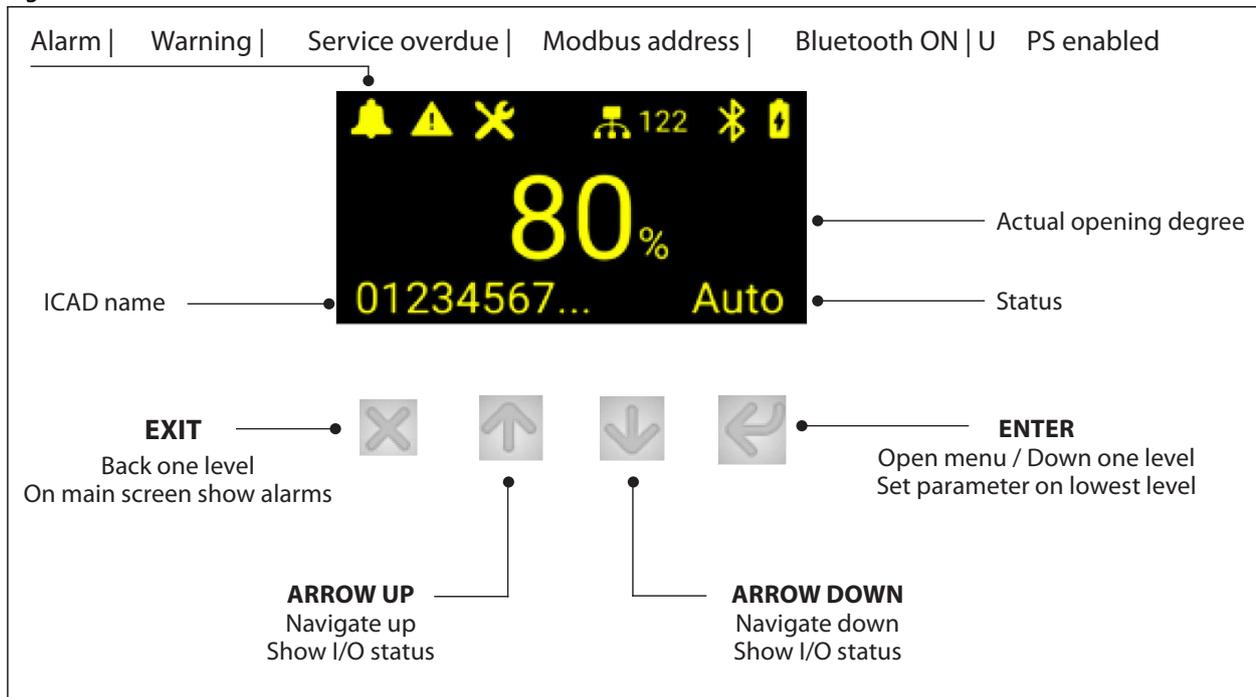


Status bar

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

1. To access the ICAD actuator menu, press ENTER button

Figure 22: STATUS BAR



2. Once you are in the menu, use the UP and DOWN arrows to move through the list of parameters
3. To display and/or change the value of the parameter, press ENTER button to view the current settings
 - 3.1. To change the value of a parameter, use the up or down arrow to establish the new value for that parameter
 - 3.2. Once the new value for the parameter has been selected, press ENTER button to save the change and return to the menu
 - 3.3. Repeat this procedure for all parameters
 - 3.4. Exit from the parameter list by pressing EXIT button or simply wait for the ICAD to return to the main display (approx. 20 seconds)

Configuration of the ICAD actuator

When it is powered for the first time, the quick setup wizard will appear, follow the instructions from the set up wizard to have it configured. If the wizard is not used, the ICAD display will go into warning mode. This warning is a reminder that the ICM valve being moved by the ICAD has not been configured. Once the ICM valve size is selected, the ICAD actuator will calibrate itself to that particular size and will then be ready to receive a control signal.

Parameter List

Service/Control Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID1	Main switch	ICAD operating mode 0: Auto: Input signal type (ID3) controls valve position 1: Manual: user manually sets the valve position to be maintained 2: Config: ICAD continues to operate as before. In config mode parameters can be changed but are not applied until setting main switch back to auto or manual	0	2	0	3000	3300	1	1 - 2	RW	Yes	3 & 6, 16
ID2	Operation mode	Define ICAD mode 0: Modulating: Valve positioning according to Analog Input (see ID3) 1: ON/OFF: Operating ICM valve like an ON/OFF valve controlled via Digital Input (see ID23 for definition of fully close/fully open) 2: 3-point control: Increase/Decrease Opening Degree by Digital Input.	0	2	0	3001	3301	1	1 - 2	RW	Yes	3 & 6, 16
ID3	Input signal type	Type of AI signal from external controller Only active when Operation mode (ID2) is set to Modulating. If the input signal received does not match this setting an Input signal out of bounds (A3) alarm will show. 0: 0-20mA; 1: 4-20mA; 2: 0-10V; 3: 2-10V; 4: modbus; 5: non config	0	5	5	3002	3302	1	1 - 2	RW	Yes	3 & 6, 16

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID4	Requested Opening Degree (set-point)	Set the desired opening degree Only when main switch is set to manual (ID1=1) 0...100% (min step – 1%)	0	100	0	3003	3303	1	1 - 1	RW	No	3 & 6, 16
ID203	Requested Opening Degree (set-point)	The opening degree requested through Modbus Only active when Main switch is set to auto (ID1=0) and input signal is set to Modbus (ID3=4). 0...10000 points, where 100 = 1% (i.e. 5021 = 50.21%; 10000 = 100.00%)	0	10000	0	3004	3304	2	1 - 1	RW	No	3 & 6, 16
ID24	Service passcode (Level 2)	Change password for level 2 access. Level 2 will give access to read/write parameters of level 2. See Column "Password level to Read - Write" and "Read only / Read Write"	0	99999999	12131400	3005 ... 3006		4	2	W	Yes	16

Service/Advanced Control Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID5	Speed positive, 3-point	Opening speed Only active when Operation mode (ID2) is set to 3-point. Percentage of full speed. 1...100% (min step – 1%)	1	100	10	3011		1	2 - 2	RW	Yes	3 & 6, 16
ID75	Speed negative, 3-point	Closing speed Only active when Operation mode (ID2) is set to 3-point. Percentage of full speed. 1...100% (min step – 1%)	1	100	10	3012		1	2 - 2	RW	Yes	3 & 6, 16
ID6	Speed positive, on/off	Opening speed Only active when Operation mode (ID2) is set to ON/OFF. Percentage of full speed 1...100% (min step – 1%)	1	100	100 - ICAD 600; 50 - ICAD 1200	3013		1	2 - 2	RW	Yes	3 & 6, 16
ID76	Speed negative, on/off	Closing speed Only active when Operation mode (ID2) is set to ON/OFF. Percentage of full speed 1...100% (min step – 1%)	1	100	100 - ICAD 600; 50 - ICAD 1200	3014		1	2 - 2	RW	Yes	3 & 6, 16
ID7	Speed, modulating	Speed while modulating Only active when Operation mode (ID2) is set to Modulating. Percentage of full speed 1...100% (min step – 1%) For CVE valve max value = 50%	1	100	100 - ICAD 600; 50 - ICAD 1200	3015		1	2 - 2	RW	Yes	3 & 6, 16
ID9	Automatic valve detection	Valve size detection for ICAD 0: No: Not active 1: Yes: Valve detection will be started. The parameter will automatically be set back to 'no' and ID8 valve configuration parameter will be set to the detected valve when detection has finished.	0	1	0	3009	3305	1	1 - 2	RW	Yes	3 & 6, 16

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID8	Valve configuration	<p>Valve size detection action for ICAD</p> <p>Note: The allowed value of the parameter varies depends on the ICAD model parameter (ID73)</p> <p>12: ICADTS ICMTS 50/80; 11: ICADTS ICMTS20; 10: Pilot Valve CVE; 9: ICAD1200B ICM150; 8: ICAD1200B ICM125; 7: ICAD1200B ICM100; 6: ICAD1200B ICM65; 5: ICAD1200B ICM50; 4: ICAD1200B ICM40; 3: ICAD600B ICM32; 2: ICAD600B ICM25; 1: ICAD600B ICM20; 0: not configured No valve selected. Alarm A1 will become active</p>	0	12	0	3010	3306	1	1 - 2	RW	Yes	3 & 6, 16
ID23	DI function	<p>Defines what happens when DI is ON (DI terminals are shorted) Only active when operation mode (ID2) is set to ON/OFF.</p> <p>1: Open valve: DI = ON => Close ICM valve 0: Close valve: DI = ON => Open ICM valve</p>	0	1	0	3025	3310	1	1 - 2	RW	Yes	3 & 6, 16
ID13	(Inverse) operation	<p>When Operation mode (ID2) is set to modulating.</p> <p>1: On: Increasing Analog Input signal => Decreasing opening degree 0: Off: Increasing Analog Input signal => Increasing opening degree</p> <p>When Operation mode (ID2) is set to 3-point.</p> <p>1: On: DI1 = ON, DI2 = OFF => Decreasing opening degree DI1 = OFF, DI2 = ON => Increasing opening degree DI1 = DI2 = OFF => Maintain current position 0: Off: DI1 = ON, DI2 = OFF => Increasing opening degree DI1 = OFF, DI2 = ON => Decreasing opening degree DI1 = DI2 = OFF => Maintain current position DI1 = DI2 = ON => Maintain current position</p> <p>Note: Not active when Operation mode is set to ON/OFF. For ON/OFF control refer to DI function (ID23)</p>	0	1	0	3016		1	2 - 2	RW	Yes	3 & 6, 16
ID157	2 step ON/OFF	<p>Active if operation mode (ID2) is set to on/off</p> <p>1: Yes: On/off mode with 2 step opening and/or 2 step closing. Activates parameters ID158...ID162 0: No: On/off mode with 1 step opening or closing, without additional steps while driving</p>	0	1	0	3270	3312	1	1 - 2	RW	Yes	3 & 6, 16

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID158	2 step mode	2 step mode 2: Open & close; 1: Close; 0: Open	0	2	2	3271	3313	1	1 - 2	RW	Yes	3 & 6, 16
ID159	Open step	Only active if 2 step mode (ID158) is set to 0 (Open) or 2 (Open & close) The valve will stop in this position before moving to the fully open (100%) position 0...75% (min step – 1%)	0	75	20	3272	3314	1	1 - 2	RW	Yes	3 & 6, 16
ID160	Close step	Only active if 2 step mode (ID158) is set to 1 (Close) or 2 (Open & close) The valve will stop in this position before moving to the fully closed (0%) position 0...75% (min step – 1%)	0	75	20	3273	3315	1	1 - 2	RW	Yes	3 & 6, 16
ID161	1st step delay (Open)	Only active if 2 step mode (ID158) is set to 0 (Open) or 2 (Open & close) 5...600 seconds (min step – 1)	5	600	30	3274	3316	2	1 - 2	RW	Yes	3 & 6, 16
ID162	1st step delay (Close)	Only active if 2 step mode (ID158) is set to 1 (Close) or 2 (Open & close) 5...600 seconds (min step – 1)	5	600	30	3275	3317	2	1 - 2	RW	Yes	3 & 6, 16
ID16	Forced closing	Enable/Disable forced closing Not active when CVE valve is chosen (ID8) 1: On: When valve Opening Degree < 3% it will be forced to close regardless of requested ICM valve Opening Degree 0: Off: When valve Opening Degree < 3% no forced closing will take place. Disabling forced closing is not recommended as it can lead to leaking valves.	0	1	1	3017		1	2 - 2	RW	Yes	3 & 6, 16
ID17	Automatic calibration	ICAD indicates in display when calibration is taking place. Calibration is also performed after the selection of a valve (ID8). It will automatically set back to 0 after calibration is performed. 2: Extended: Calibration from fully closed to fully open 1: Normal: Forced calibration to fully closed 0: None: No calibration performed	0	2	0	3018		1	2 - 2	RW	No	3 & 6, 16
ID151	Startup calibration	Selection of startup calibration type 1: Extended: Calibration from fully closed to fully open 0: Normal: Forced calibration to fully closed	0	1	0	3027	3311	2	1 - 2	RW	Yes	3 & 6, 16

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID18	AO Signal output	<p>Type of AO signal for valve position. This selection must match the output expected to read this externally. AO signal calculation is based on the encoder.</p> <p>2: 4-20 mA; 1: 0-20 mA; 0: no signal</p>	0	2	2	3020	3307	1	1 - 2	RW	Yes	3 & 6, 16
ID21	UPS supply	<p>Define if an Uninterruptible Power Supply (UPS) is applied to the ICAD. This enables A4 alarms (Low voltage of UPS supply).</p> <p>1: Yes: UPS is attached 0: No: Nothing attached</p>	0	1	0	3023	3308	1	1 - 2	RW	Yes	3 & 6, 16
ID22	UPS setting	<p>Defines when the health indication of a UPS can be considered as good. Only active if UPS supply (ID21) is set to yes. This enables the UPS signal of health alarm (A14) and shows the health state of the UPS for ICAD.</p> <p>2: DI Low: good health; 1: DI High: good health; 0: Off: no UPS health detection</p>	0	2	0	3024	3309	1	1 - 2	RW	Yes	3 & 6, 16

Service/Alarm Configuration Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID19	AO Alarm signal output	<p>Defines if analog output should signal active alarms Setting this to a value means that the output will be set to this value whenever ICAD is in alarm mode. Only active when AO signal (ID18) is set to 4-20mA.</p> <p>2: 22mA: Analog output will be set to 22 mA in case of active alarms(s)</p> <p>1: 3.6mA: Analog output will be set to 3.6 mA in case of active alarm(s)</p> <p>0: Off: Analog output will continue to signal the valve position</p> <p>Note: When setting this to anything other than Off, the analog output will not signal valve position whenever ICAD is in alarm mode.</p>	0	2	0	3021	3318	1	1 - 2	RW	Yes	3 & 6, 16
ID20	Emergency state	<p>Set the requested valve position for safe state Safe state occurs for A2, A3, A5, A8, A10, and can be a result of the boosting process during A9.</p> <p>3: emergency opening degree (set position to ID27)</p> <p>2: maintain position;</p> <p>1: open valve;</p> <p>0: close valve;</p>	0	3	0	3022	3319	1	1 - 2	RW	Yes	3 & 6, 16
ID27	Emergency OD	<p>The opening degree to use in safe state Only active when Emergency state (ID20) is set to emergency opening degree (ID27)</p> <p>0...100% (min step – 1%)</p>	0	100	50	3026	3320	1	1 - 2	RW	Yes	3 & 6, 16
ID229	Reset alarm A9	<p>Manual reset of active A9 alarm Only active if boost action (ID28) is set to once, and reset A9 alarms (ID31) is set to manual or auto.</p> <p>1: Yes: Active A9 alarm will be reset, safe state will be cancelled and ICAD will go to the requested OD. This parameter will automatically be set back to 'No' once the alarm is reset.</p> <p>0: No: Active alarms are not reset. (Default state)</p>	0	1	0	3035	3321	1	1 - 1	RW	No	3 & 6, 16

Service/Boost Function Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID28	Boost action	<p>Defines how to manage when the opening degree is outside of the threshold of the max offset allowed (ID30).</p> <p>2: Once: If boosting for 15 seconds did not allow to get back into position, then A9 alarm is raised and ICAD goes to Safe state (ID20) (if feasible), no calibration.</p> <p>1: Cycling: Keep boosting 15 seconds, break for the time specified as boost delay (ID29), then raise A9 alarm. Cycle continues position has been regained.</p> <p>Note: It is not recommended to change this setting from default.</p>	1	2	1	3030		1	2 - 2	RW	Yes	3 & 6, 16
ID29	Boost delay	<p>Minutes after boost before next boost and raise of A9 alarm. 1...30 minutes (min step – 1)</p> <p>Note: It is not recommended to change this setting from default.</p>	1	30	1	3031		1	2 - 2	RW	Yes	3 & 6, 16
ID30	Max offset	<p>Max offset value between encoder position and step counter position before boosting starts.</p> <p>3...15% (min step – 1%)</p>	3	15	3	3032		1	2 - 2	RW	Yes	3 & 6, 16
ID31	Reset A9 Alarms	<p>Define how to Reset/ Suppress A9 alarm and DO Common Alarm ON.</p> <p>2: Suppress: Ignore detection of the stall. No alarm is raised and DO Common Alarm output remains OFF.</p> <p>1: Auto: Reset when it is within max offset (ID30) limit again and reset delay time (ID32) has elapsed</p> <p>0: Manually: User resets alarm using the reset alarm action.</p> <p>Note: It is not recommended to change this setting from default.</p>	0	2	1	3033		1	2 - 2	RW	Yes	3 & 6, 16
ID32	Reset A9 Alarm delay	<p>Define the reset delay for A9 alarms.</p> <p>Only active when reset A9 alarm (ID31) is set to auto.</p> <p>1...20 minutes (min step – 1)</p> <p>Note: It is not recommended to change this setting from default, and this value should always be longer than the boost delay (ID29)</p>	1	20	5	3034		1	2 - 2	RW	Yes	3 & 6, 16

Service/System Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID49	Service reminder	Use a service reminder for when the valve should be serviced in order to maintain operation of the system. ICAD will initiate a warning when Time to next service (ID50) reaches 0. Valves should be checked once a year. This is enabled by default. 1: Turn On Service reminder 0: Turn Off Service reminder	0	1	0	3062	3349	1	1 - 2	RW	Yes	3 & 6, 16
ID51	Reset service interval	Reset the current service interval. This is required when ICAD has warning 'Service interval overdue (A15)' active, and the valve has been physically examined by a technician. 1: Yes: Time overdue will be reset. Time to next service will be set to Service interval. The parameter will automatically be set back to 'no'. 0: No: Not active	0	1	0	3066		1	2 - 2	RW	No	3 & 6, 16
ID234	Service interval	Indicates the service interval until the valve should be checked. This is by default once a year. 1...999 (in days)	1	999	365	3065	3352	2	1 - 2	RW	Yes	3 & 6, 16
ID26	Clear event log	Clear event log 1: Yes: All event log entries will be hidden. The parameter will automatically be set back to 'no' when hide has finished 0: No: Not active	0	1	0	3123		1	2 - 2	RW	No	3
ID52	User logout time	The time user remains logged in to service mode without doing any actions before automatically logged out 30...1200 (in seconds)	30	1200	360	3067		2	1 - 2	RW	Yes	3 & 6, 16
ID53	ICAD name	Name assigned to ICAD as the identification shown on built-in display and for connection via Bluetooth. 16 ASCII symbols, 8bits per symbol (2 symbols per register)			ICAD	3068 ... 3075	3353 ... 3360	30	1 - 2	RW	Yes	3 & 6, 16
ID54	Bluetooth enable	Enable ICAD to broadcast Bluetooth for remote connection via APP. 1: enable; 0: disable	0	1	1	3076	3361	1	1 - 2	RW	Yes	3 & 6, 16
ID236	Factory reset	Factory reset action for ICAD 1: Yes: All parameters will be returned to factory default settings, and the event log will be cleared. The parameter will automatically be set back to 'no' when factory reset has finished 0: No: Not active	0	1	0	3087		1	2 - 2	RW	No	3 & 6, 16

Service/Display Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID56	Backlight	Manage the backlight level of the built-in display on ICAD 1...100% (min step – 1%)	1	100	50	3091	3381	1	1 - 2	RW	Yes	3 & 6, 16
ID57	Contrast	Manage the contrast level of the built-in display on ICAD 1...100% (min step – 1%)	1	100	50	3092	3382	1	1 - 2	RW	Yes	3 & 6, 16

Service/Network Parameters, (RS485)

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID58	Modbus network address	Modbus RS485 network address of ICAD This is shown in display when the ICAD supports Modbus communication and Modbus is enabled.	1	247	1	3100	3391	1	1 - 2	RW	Yes	3 & 6, 16
ID59	Modbus baud rate	The baud rate your Modbus RS485 controller uses to be able to communicate with ICAD via Modbus. 8: 115200 7: 57600; 6: 38400; 5: 19200; 4: 14400; 3: 9600; 2: 4800; 1: 2400; 0: 1200;	0	8	6	3101	3392	1	1 - 2	RW	Yes	3 & 6, 16
ID61	Modbus parity	Set via com type on display: 2: even 1: odd 0: no parity Other = custom setup via Modbus	0	2	2	3102	3393	1	1 - 2	RW	Yes	3 & 6, 16
ID63	Modbus stops bits	Modbus stops bits 1: 2 bits; 0: 1 bit	0	1	0	3103	3394	1	1 - 2	RW	Yes	3 & 6, 16

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID237	Modbus enable	Enable/disable Modbus to manage if data can be read and set via Modbus connection. 1: enable; 0: disable	0	1	1	3104	3395	1	1 - 2	RW	Yes	3 & 6, 16
ID155	Modbus heartbeat enable	Active when ID2 is modulating and ID3 is modbus 1: enable; 0: disable	0	1	0	3093	3378	2	1 - 2	RW	Yes	3 & 6, 16
ID156	Modbus heartbeat interval	When ID155 Modbus heartbeat is enabled. The interval with which the PLC should send Modbus requests to ICAD. If the ICAD does not receive any (read/write parameter) Modbus request during this interval, the A3 Alarm (signal lost) will be set 5...120 seconds (min step - 1)	5	120	30	3094	3379	2	1 - 2	RW	Yes	3 & 6, 16

Service/Network Parameters, (Ethernet)

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID116	IP address mode	Use parameters ID112, ID113, ID114 to set a Static IP. Read the current automatically received with DHCP or Auto IP address in the ID114 parameter. 2: Auto IP; 1: DHCP ⁽¹⁾ ; 0: Static IP	0	2	0	3180	3383	2	1 - 2	RW	Yes	3 & 6, 16
ID115	Ethernet port	System Port 502 is reserved specifically for Modbus applications. If you change this parameter, you must be sure what you are doing. The following ports are used by the Modbus/TCP protocol: • By default, the protocol uses Port 502 as local port in the Modbus server. • You can set the local port as you wish in the Modbus client. Usually, port numbers starting at 2000 are used. <i>*If the communication partners offer the option of setting the port numbers for the server, then it is also possible to communicate using the Modbus/TCP protocol via a port other than Port 502.</i>	1	32764	502	3181	3384	2	1 - 2	RW	Yes	3 & 6, 16
ID114	Ethernet IP address	Set the desired static IP address or read the automatically received IP. Should be different from ID113 default gateway parameter. 0x00000000...0xDFFFFFFF (4 x 8-bit values, e.g. 0xff010203 = 255.01.02.03 address)	0x00000000	0xDFFFFFFF	0xC0A80202 192.168.2.2	3182 ... 3183	3385 ... 3386	4	1 - 2	RW	Yes	Only multiple write allowed 16 & 3
ID113	Ethernet Default Gateway	<i>For static IP</i>	0x00000000	0xDFFFFFFF	0xC0A80001 192.168.0.1	3184 ... 3185	3387 ... 3388	4	1 - 2	RW	Yes	3
ID112	Ethernet Subnet Mask	<i>For static IP</i>	0x00000000	0xDFFFFFFF	0xFFFFFFFF 255.255.255.0	3186 ... 3187	3389 ... 3390	4	1 - 2	RW	Yes	3

⁽¹⁾ The device first makes a request to a DHCP server for an address. If the device does not receive an IP address, which happens when there is no DHCP server on the network or when the DHCP server is not responding, the device assigns itself an address. Auto IP addresses always follow this pattern: 169.254.x.y, where x and y are any two numbers between 0 and 255. Unlike DHCP, Auto IP does not require a router or a separate server to assign an IP address.

Status/I/O Status

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID37	DI	Readout the digital input when the operation mode (ID2) is set to ON/OFF or 3-point control. 3: DI1 - on, DI2 - on; 2: DI1 - off, DI2 - on; 1: DI1 - on, DI2 - off; 0: DI1 - off, DI2 - off; Note that for ON/OFF only DI1 is active: 1: DI1 - on 0: DI1 - off	0	3	0	3044	3328	1	1	RO	No	3
ID38	DO (fully close)	DO Fully closed status (ON when OD < 3%) 1: Yes; 0: No	0	1	0	3045	3329	1	1	RO	No	3
ID39	DO (fully open)	DO Fully opened status (ON when OD > 97%) 1: Yes; 0: No	0	1	0	3046	3330	1	1	RO	No	3
ID40	DO (alarm show)	DO common alarm status (Active when there are active alarms) 1: Active; 0: OFF	0	1	0	3047	3331	1	1	RO	No	3

Status/Next Service

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID233	Time overdue	Once the service interval has passed, and Time to next service (ID50) has reached 0, the time overdue is calculated. Time is updated every 30 minutes and calculated as full days (24 hours) based on runtime. 0...32764 (in days)	0	32764	0	3063	3350	2	1	RO	Yes	3
ID50	Time to next service	Readout the days remaining of the current service interval (ID234). Time is updated every 30 minutes and calculated as full days (24 hours) based on runtime. 0...999 (in days)	0	999	365	3064	3351	2	1	RO	Yes	3
ID48	Run time	Readout the run time in full hours for the ICAD from when it was first powered on or factory reset. Saved every 30min 0...4294967293 (in minutes)	0	4294967293	0	3060 ... 3061	3347 ... 3348	4	1	RO	Yes	3

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Status/Supply

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID228	Power supply voltage (V)	Readout the current power supply voltage to ICAD in Volt. 0...300 points, where 10 = 1V (i.e. 234 = 23.4V; 100 = 10.0V)	0	300	0	3054	3336	2	1	RO	No	3
ID227	UPS health	Readout the state of the UPS. Only active when UPS supply (ID21) is set to yes and the UPS setting (ID22) is not set to off. 1: OK; 0: Poor	0	1	0	3052	3335	1	1	RO	No	3

Status/Read Outs Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID1	Main switch	Readout the main switch state of ICAD. 2: config; 1: manual; 0: auto	0	2	0	3055	3337	1	1	RO	No	3
ID2	Mode	Readout ICAD mode 2: 3 – point; 1: on/off; 0: modulating	0	2	0	3001	3301	1	1 - 2	RW	Yes	3 & 6, 16
ID8	Valve configuration	Readout the valve configuration for ICAD. 12: ICADTS ICMTS 50/80; 11: ICADTS ICMTS20; 10: Pilot Valve CVE; 9: ICAD1200B ICM150; 8: ICAD1200B ICM125; 7: ICAD1200B ICM100; 6: ICAD1200B ICM65; 5: ICAD1200B ICM50; 4: ICAD1200B ICM40; 3: ICAD600B ICM32; 2: ICAD600B ICM25; 1: ICAD600B ICM20; 0: not configured	0	13	0	3056	3338	1	1	RO	No	3
ID34	AI (current, mA)	Readout the analog input when the operation mode (ID2) is set to modulating and the input signal (ID3) is set to use current (0-20mA or 4-20mA) 0...22000 points, where 1000 = 1mA (i.e. 10031 = 10.031mA; 7062 = 7.062mA)	0	22000	0	3041	3325	2	1	RO	No	3
ID35	AI (voltage, V)	Readout the analog input when the operation mode (ID2) is set to modulating and the input signal (ID3) is set to use voltage (0-10V or 2-10V) 0...12000 points, where 1000 = 1V (i.e. 1291 = 1.291V; 10372 = 10.372V)	0	12000	0	3042	3326	2	1	RO	No	3

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID36	AO (current, mA)	Readout the analog output when AO signal output (ID18) is set to use (0-20mA or 4-20mA) 0...22000 points, where 1000 = 1mA (i.e. 10031 = 10.031mA; 7062 = 7.062mA)	0	22000	0	3043	3327	2	1	RO	No	3
ID21	UPS supply	Readout of Uninterruptible Power Supply (UPS) is applied to the ICAD. This enabled A4 alarms (Low voltage of UPS supply). 1: yes; 0: no	0	1	0	3023	3308	1	1 - 2	RW	Yes	3 & 6, 16
ID20	Emergency state	Readout of the requested valve position for safe state. Safe state occurs for A2, A3, A5, A8, A10, and can be a result of the boosting process during A9. 3: emergency opening degree (set position to ID27) 2: maintain position; 1: open valve; 0: close valve;	0	3	0	3022	3319	1	1 - 2	RW	Yes	3 & 6, 16
ID28	Boost action	Readout of boost action. How to manage when the opening degree is outside of the threshold of the max offset allowed (ID30). 2:Once: If boosting for 15 seconds did not allow to get back into position, then A9 alarm is raised and ICAD goes to Safe state (ID20) (if feasible), no calibration. 1: Cycling: Keep boosting 15 seconds, break for the time specified as boost delay (ID29), then raise A9 alarm. Cycle continues position has been regained. Note: It is not recommended to change this setting from default.	1	2	1	3030		1	2 - 2	RW	Yes	3 & 6, 16
ID29	Boost delay	Readout of boost delay. Minutes after boost before next boost and raise of A9 alarm. 1...30 minutes (min step – 1) Note: It is not recommended to change this setting from default.	1	30	1	3031		1	2 - 2	RW	Yes	3 & 6, 16
ID30	Max offset	Max offset value between encoder position and step counter position before boosting starts. 3...15% (min step – 1%)	3	15	3	3032		1	2 - 2	RW	Yes	3 & 6, 16

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID31	Reset A9 Alarms	Define how to Reset/ Suppress A9 alarm and DO Common Alarm ON. 2: Suppress: Ignore detection of the stall. No alarm is raised and DO Common Alarm output remains OFF. 1: Auto: Reset when it is within max offset (ID30) limit again and reset delay time (ID32) has elapsed 0: Manually: User resets alarm using the reset alarm action. Note: It is not recommended to change this setting from default.	0	2	1	3033		1	2 - 2	RW	Yes	3 & 6, 16
ID32	Reset A9 Alarm delay	Define the reset delay for A9 alarms. Only active when reset A9 alarm (ID31) is set to auto. 1...20 minutes (min step - 1) Note: It is not recommended to change this setting from default, and this value should always be longer than the boost delay (ID29)	1	20	5	3034		1	2 - 2	RW	Yes	3 & 6, 16
ID42	Temperature	Readout the internal temperature measured on the ICAD motor board in degree celcius. -500...1400 points, where 10 = 1°C (i.e. -125 = -12.5°C; 1245 = 124.5°C)	-500	1400	0	3050	3334	2	1	RO	No	3
ID54	Bluetooth	Manage if ICAD broadcasts Bluetooth for remote connection via APP. 1: enable; 0: disable	0	1	1	3076	3361	1	1 - 2	RW	Yes	3 & 6, 16
ID237	Modbus	Enable/disable Modbus to manage if data can be read and set via Modbus connection. 1 = enable; 0 = disable	0	1	1	3104	3395	1	1 - 2	RW	Yes	3 & 6, 16

Alarms/Alarm Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID120	A1 timestamp (Warn: Valve no config)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set [ID48 (while the device is working)] - [event/alarm timestamp (point in ID48 at which the current event occurred)] = minutes that have passed since the event/ alarm occurred (to show XX minutes(or hours) ago)	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3200 ... 3201	3404 ... 3405	4	1	RO	No	3
ID121	A2(1) timestamp (Alarm: IO MCU comm fail)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3202 ... 3203	3406 ... 3407	4	1	RO	No	3
ID122	A2(2) timestamp (Alarm: Motor open-load status)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3204 ... 3205	3408 ... 3409	4	1	RO	No	3
ID123	A3(1) timestamp (Alarm: AI error: > 22 mA)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3206 ... 3207	3410 ... 3411	4	1	RO	No	3
ID124	A3(2) timestamp (Alarm: AI error: < 2 mA)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3208 ... 3209	3412 ... 3413	4	1	RO	No	3
ID125	A3(3) timestamp (Alarm: AI error: > 12 V)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3210 ... 3211	3414 ... 3415	4	1	RO	No	3
ID126	A3(4) timestamp (Alarm: AI error: < 1 V)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3212 ... 3213	3416 ... 3417	4	1	RO	No	3
ID127	A4 timestamp (Alarm: V FSS error)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3214 ... 3215	3418 ... 3419	4	1	RO	No	3
ID128	A5 timestamp (Alarm: V PS error)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3216 ... 3217	3420 ... 3421	4	1	RO	No	3
ID129	A6 timestamp (Alarm: Calibr fail)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3218 ... 3219	3422 ... 3423	4	1	RO	No	3
ID130	A7 timestamp (Alarm: Overheating)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3220 ... 3221	3424 ... 3425	4	1	RO	No	3

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID131	A8 timestamp (Alarm: Overheating)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3222 ... 3223	3426 ... 3427	4	1	RO	No	3
ID132	A9 timestamp (Alarm: POM mode)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3224 ... 3225	3428 ... 3429	4	1	RO	No	3
ID133	A10 timestamp (Alarm: SPI conn loss)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3226 ... 3227	3430 ... 3431	4	1	RO	No	3
ID134	A11 timestamp (reserved)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3228 ... 3229	3432 ... 3433	4	1	RO	No	3
ID135	A13 timestamp (Alarm: Failed update)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3230 ... 3231	3434 ... 3435	4	1	RO	No	3
ID136	A14 timestamp (Warn: SoH is bad)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3232 ... 3233	3436 ... 3437	4	1	RO	No	3
ID137	A15 timestamp (Warn: Service overdue)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3234 ... 3235	3438 ... 3439	4	1	RO	No	3
ID138	A16 timestamp (Warn: Config. mode)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3236 ... 3237	3440 ... 3441	4	1	RO	No	3
ID139	A17 timestamp (Warn: Bluetooth conn)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3238 ... 3239	3442 ... 3443	4	1	RO	No	3
ID140	A18 timestamp (Warn: Vin >24+10%)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3240 ... 3241	3444 ... 3445	4	1	RO	No	3
ID141	A19 timestamp (Warn: Vin <24-15%)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3242 ... 3243	3446 ... 3447	4	1	RO	No	3
ID146	A20 timestamp (Alarm: Detection fail)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3244 ... 3245	3448 ... 3449	4	1	RO	No	3
ID148	A2(3) timestamp (Alarm: EEPROM operation fail)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3246 ... 3247	3450 ... 3451	4	1	RO	No	3

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID149	A2(4) timestamp (Alarm: Bluetooth MCU comm fail)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3248 ... 3249	3452 ... 3453	4	1	RO	No	3
ID150	A3(5) timestamp (Alarm: Modbus connection lost)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3250 ... 3251	3454 ... 3455	4	1	RO	No	3
ID152	A1(2) timestamp (Warn: Input signal not configured)	Timestamp of the alarm occurrence relative to the runtime counter (ID48), Or -1 (0xFFFFFFFF in hex) if the alarm is not set	-1	4294967294	4294967295 (-1, or 0xFFFFFFFF in hex)	3252 ... 3253	3456 ... 3457	4	1	RO	No	3

Alarms/Event Log Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID43	Stalls	Readout the total stalls (times ICAD stopped due to A9 alarms) done by the ICAD from when it was first powered on. Saved every 30min.	0	32764	0	3120	3396	2	1	RO	Yes	3
ID46	Full strokes	Readout the total strokes (movement) done by the ICAD from when it was first powered on. Saved every 30min. Full strokes are defined as 0% to 100% to 0% opening degree.	0	4294967293	0	3121 ... 3122	3397 ... 3398	4	1	RO	Yes	3
ID230	Alarm A9 (total counter)	Total number of A9 alarms for the ICAD is tracked.	0	32764	0	3124	3399	2	1	RO	Yes	3

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID241	Active alarms	Shows active alarms (e.g. value 0x00000406 = 0000 0000 0000 0000 0000 0100 0000 0110 -> alarms A2, A3, A8 have been set and active) 0th bit: A2 (IO MCU comm fail); 1st bit: A2 (open-load status); 2nd bit: A3 (AI error: > 22 mA); 3rd bit: A3 (AI error: < 2 mA); 4th bit: A3 (AI error: > 12 V); 5th bit: A3 (AI error: < 1 V); 6th bit: A4 (V FSS error); 7th bit: A5 (V PS error); 8th bit: A6 (Calibr fail); 9th bit: A7 (Overheating); 10th bit: A8 (Overheating); 11th bit: A9 (POM mode); 12th bit: A10 (SPI conn loss); 13th bit: A13 (Failed update); 14th bit: A20 (Detection fail); 15th bit: A2 (EEPROM operation fail); 16th bit: A2 (Bluetooth MCU comm fail); 17th bit: A3 (Modbus connection lost)			0	3129 ... 3130	3400 ... 3401	4	1	RO	No	3
ID248	Active warnings	Shows active warnings 0th bit: A1 (Valve not config); 1st bit: A11 (<i>reserved</i>); 2nd bit: A14 (SoH is bad); 3rd bit: A15 (Service overdue); 4th bit: A16 (Config. mode); 5th bit: A17 (Bluetooth conn); 6th bit: A18 (Vin >24+10%); 7th bit: A19 (Vin <24-15%); 8th bit: A1 (Input not config)			0	3131	3402	2	1	RO	No	3
ID232	Total events	Total number of events in the event log (the maximum value is changeable, depends on the types of events in the event log)	0	1000	0	3132	3403	2	1	RO	No	3

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Info

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID53	ICAD name	Name assigned to ICAD as the identification shown on built-in display and for connection via Bluetooth. 16 ASCII symbols, 8bits per symbol (2 symbols per register)		ICAD	3068 ... 3075	3353 ... 3360	30	1 - 2	RW	Yes	3 & 6, 16	
ID253	ICAD model	Readout the ICAD model type. 3: ICADB TS 2: ICAD 1200B; 1: ICAD 600B; 0: not configured;	0	3	0	3057	3339	1	1	RO	Yes	3
ID8	Valve configuration	Readout the valve configuration for ICAD 12: ICADBTS ICMTS 50/80; 11: ICADBTS ICMTS20; 10: Pilot Valve CVE; 9: ICAD1200B ICM150; 8: ICAD1200B ICM125; 7: ICAD1200B ICM100; 6: ICAD1200B ICM65; 5: ICAD1200B ICM50; 4: ICAD1200B ICM40; 3: ICAD600B ICM32; 2: ICAD600B ICM25; 1: ICAD600B ICM20; 0: not configured	0	13	0	3056	3338	1	1	RO	No	3
ID221	SW Version (High)	Readout the software version of ICAD nn.xx	0	255	0	3048	3332	1	1	RO	No	3
ID222	SW Version (Low)	Readout the software version of ICAD xx.nn	0	255	0	3049	3333	1	1	RO	No	3
ID143	Hardware version	Format MM.CC (1 byte Motor PCB, 1 byte Connector PCB) (e.g. value 0x0102 = 01.02v - > 01 Motor PCB version, 02 Connector PCB version) (reserved up to 0xFFFFFFFF)	0x0000	0xFFFF	0x0000	3156 ... 3157	3345 ... 3346	4	1	RO	No	3
ID102	Previously configured	Indicates if this ICAD has previously been configured. This controls when the setup wizard is shown when connecting to ICAD via the APP. 1: configured; 0: not configured	0	1	0	3089		1	1 - 2	RW	Yes	3 & 6, 16
ID235	Serial number	The unique serial number of ICAD. Number generated by: nnnnnnCCCCPPWWYY - running number (n) + Product number (Cs) + Mfg place& time nnnnnn part - 2 registers CCCCCC PP parts - 5 registers, in ASCII symbols, 8bits per symbol (2 symbols per register) WW part - 1 register YY part - 1 register D part - 1 register			0	3077 ... 3086	3362 ... 3371	30	1	RO	Yes	3
ID48	Run time	Readout the run time in full minutes for the ICAD from when it was first powered on. Saved every 30min (in minutes)	0	4294967293	0	3060 ... 3061	3347 ... 3348	4	1	RO	Yes	3 & 6, 16

Non-displayed Parameters

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID55	Screen saver	Manage the time elapsed without user actions before the built-in display of ICAD goes to sleep mode (in seconds). Pressing any button ends the screen saver mode	30	1200	360	3090	3380	2	1 - 2	RW	Yes	3 & 6, 16
ID226	Status	Readout the current ICAD status 6: Config: ICAD continues to operate as before. In config mode parameters can be changed but are not applied until setting main switch back to auto or manual 5: Valve detection: ICAD is currently detecting a valve 4: Safe state: ICAD has stopped operation and applied the emergency state setting (ID20) 3: Boost: ICAD is currently boosting to achieve the requested position 2: Calibration: ICAD is currently calibrating 1: Manual: User manually sets the valve position to be maintained 0: Auto: Input signal type (ID3) controls valve position	0	6	0	3051	3322	1	1	RO	No	3
ID33	Current OD	Readout the opening degree (OD). 0...10000 points, where 100 = 1% (I.e. 5219 = 052.19%; 10000 = 100.00%)	0	10000	0	3040	3323	2	1	RO	No	3
ID211	Requested OD	Readout the requested opening degree automatically matching the settings for input type and operation mode. 0...10000 points, where 100 = 1% (I.e. 5219 = 052.19%; 10000 = 100.00%)	0	10000	0	3053	3324	2	1	RO	No	3
ID254	Current access level	Readout the current access level corresponding to user login. This manages rights for reading and writing parameters, and controls what the user sees 3: Danfoss Admin; 2: Service; 1: Read only	1	3	1	3058	3340	1	1-2	RW	No	3
ID239	Battery voltage	Readout the current voltage of the UPS battery, when this is attached and enabled. 0...300 points, where 10 = 1V (I.e. 234 = 23.4V; 100 = 10.0V)	0	300	0	3059	3341	1	1	RO	No	3

Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Label ID	Parameter name	Description and selection options	Min.	Max.	Factory setting	Modbus address	Alternative Modbus address	Size in bytes	Password level to Read - Write	Read only (RO) / Read Write (RW) / Write (W)	Persistent Yes/No	Modbus function
ID103	Controller ID	Readout the controller ID to determine that this is an ICAD. 70 = ICAD			70	5001			1	RO	No	
ID231	REBOOT	Reboot ICAD 1: Yes: The device will reboot. The parameter will automatically be set back to 'no' 0: No: Not active	0	1	0	3088		1	2 - 2	RW	No	3 & 6, 16
ID100	Passcode entry	Enter password for level 2 or level 3 access	0	99999999	0	3160 ... 3161		4	1	W	No	16

Ordering

Table 17: ICMTS 20

Type	Code number
ICMTS 20^(*)	
ICMTS 20-A33	027H1084
ICMTS 20-A	027H1085
ICMTS 20-B66	027H1093
ICMTS 20-B	027H1086
ICMTS 20-C	027H1087

^(*) ICMTS 20 available with 25mm butt weld DIN (EN 10220) connectors

Table 18: ICMTS 50/80 housings

Type	Code number
SVL-140B 50 A/D ANG	148B5861
SVL-140B 50 A/D STR	148B5862
SVL-140B 50 SA/SD ANG	148B6861
SVL-140B 50 SA/SD STR	148B6862
SVL-140B 80 A/D ANG	148B5971
SVL-140B 80 A/D STR	148B5972

Figure 23: ICMTS top part

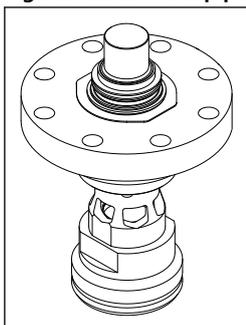


Table 19: Top part complete

Type	Code no.
ICMTS 50A Function module K _v 9 (DN50)	027H3510
ICMTS 80A Function module K _v 18 (DN80)	027H3511
ICMTS 80B Function module K _v 27 (DN80)	027H3512

Figure 24: ICAD 600B-TS

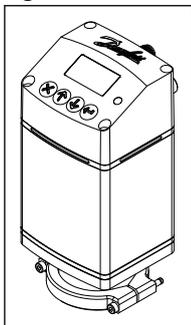


Table 20: ICAD 600B-TS for ICMTS 20-80

Type	Code no.
ICAD 600B-TS, with display, Bluetooth, RS485	027H0495
ICAD 600B-TS, with display, Bluetooth, Ethernet	027H0496
ICAD 600B-TS, without display, Bluetooth, Rs485	027H0498
ICAD 600B-TS, without display, Bluetooth, Ethernet	027H0499

Spare parts

ICMTS 20

Figure 25: Valve orifice

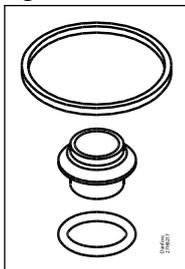


Table 21: Service kit 1 - valve orifice for ICMTS 20

Type	Code no.
Gasket kit with orifice for B and C cones	027H1192
Gasket kit with orifice for A33 and A (new design) cones	027H1193

Figure 26: ICMTS top part

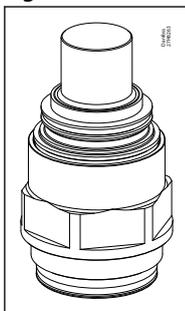
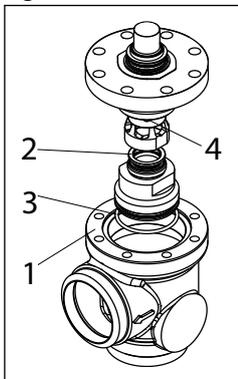


Table 22: Service kit 2 - Top part with cone complete

Type	Code no.
ICMTS 20-A33 top part with cone and orifice kit	027H1088
ICMTS 20-A top part with cone and orifice kit	027H1080
ICMTS 20-B66 top part with cone and orifice kit	027H1094
ICMTS 20-B top part with cone and orifice kit	027H1081
ICMTS 20-C top part with cone and orifice kit	027H1082

ICMTS 50/80

Figure 27: Service Kits



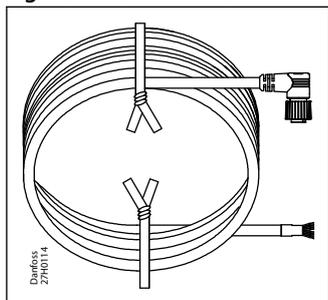
Motor operated valve, type ICMTS with actuator, type ICAD 600B-TS

Table 23: Inspection/Repair kits

Type	Code no.
Inspection ICMTS 50 Kit (Flat gasket pos. 1, O-ring pos. 3)	027H3412
Inspection ICMTS 80 Kit (Flat gasket pos. 1, O-ring pos. 3)	027H3413
Repair kit ICMTS 50 (Flat gasket pos. 1, O-ring pos. 3, PTFE sealing pos. 2, M4 Bolts pos. 4)	027H3414
Repair kit ICMTS 80 (Flat gasket pos. 1, O-ring pos. 3, PTFE sealing pos. 2, M4 Bolts pos. 4)	027H3415

Accessories

Figure 28: Cable for ICAD



Cables should be ordered separately.

Table 24: ICAD B cable set with 3x cables (power supply, control signal and data communication)

Length	Code no.
ICAD B Cable set 1,5m (3x cables)	027H0464
ICAD B Cable set 3m (3x cables)	027H0465
ICAD B Cable set 10m (3x cables)	027H0466
ICAD B Cable set 15m (3x cables)	027H0467

Table 25: ICAD A and ICAD B cable set with 2x cables (power supply and control signal)

Length	Code no.
ICAD A and ICAD B Cable set 1,5m (2x cables)	027H0426
ICAD A and ICAD B Cable set 3,0m (2x cables)	027H0438
ICAD A and ICAD B Cable set 10m (2x cables)	027H0427
ICAD A and ICAD B Cable set 15m (2x cables)	027H0435

Table 26: Accessories

Type	Code no.
Service kit 600B-TS (10 pcs of o-rings for magnetic coupling)	027H0429

Figure 29: ICAD-UPS



Table 27: ICAD-UPS

Type	Code no.
ICAD-UPS	027H0388

Figure 30: ICAD Protection Cap

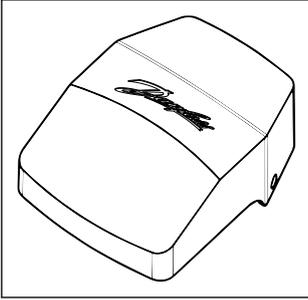


Table 28: ICAD Protection Cap

Type	Code no.
ICAD-B Protective cover	027H0468

Figure 31:
Multi-function
tool



Table 29: Multi-function tool

Type	Code no.
Multi-function tool	027H0181

Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 30: ICMTS

File name	Document type	Document topic	Approvals Authority
033F0691.AI	Manufacturers Declaration	RoHS	Danfoss
033F0686.AS	Manufacturers Declaration	PED	Danfoss

Table 31: ICAD B

File name	Document type	Document topic	Approvals Authority
E258350	Electrical - Safety Certificate	-	UL
027R0723	Manufacturers Declaration	FCC	Danfoss

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