

Biffi ICON3000

Intelligent, Multi-Turn Electric Valve Actuator



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Actuator Models

General Information

Table 1. General Information

General	Non-intrusive intelligent multi-turn electric actuator
Starter	Integrated

Specifications

Table 2. Specifications

Enclosure	Aluminum alloy highly resistant to corrosion, with few joints.		
Control Enclosure	The enclosure includes logic circuit boards, power boards, reversing contactor, non-intrusive local interface with three push-buttons (for open, stop and close control and actuator configuration), LED indicators (yellow, green and red) and selector with local, remote and off positions. Standard features included are: Automatic Phase Correction, Phase Failure Detection, Anti-hammer Protection, Jammed Valve Protection, Instantaneous Reversal Protection, ESD, Contactor Failure, Electronic Temperature Warning, Electronic Nameplate, Timer, Double Displays.		
Lubrication	Lubricated in a hydraulic oil bath for the entire duration of the actuator's service life.		
Manual Operation	Handwheel and lockable engagement lever, painted black, with automatic de-clutch when the motor starts; the handwheel will not rotate during the electric operation.		
Torque and Position sensor	High-precision and high-resolution torque sensor. Torque detection is based on motor torque vs. speed characteristics, voltage and temperature compensated. Position sensors based on absolute encoder, controlled by a dedicated microprocessor with low power consumption. The Limit Position can be adjusted from 0 to 100% of the open position. The Output Torque can be adjusted from 40 to 100% of the nominal torque.		
Bypass Torque	Torque intervention bypass time function allows the actuator to output its maximum torque at the beginning of the stroke, with a bypass time configurable from 0 to 20%.		
Diagnostics	Data logger, warnings and alarm diagnostic messages available on local display or remotely transmitted, for high efficiency preventive maintenance programs and actuator status control. Instantaneous and historical data available.		
Diagnosis and Control	ICON diagnostic software is capable of detecting internal faults in the main functional systems and inhibit operation by actuator. Anomalies are reported locally by the display and via remote control. Using the display and push-button panel, it is possible to navigate through the menu and obtain complete information about the fault and correct identification and interpretation.		
2_Speed_Timer	Software routine to extend the actuator travelling time in opening and/or in closing direction.		
Monitor Relay	One (1) contact signal to indicate when the actuator is not available for remote control due to one or more of the ALARM conditions.		
Remote Output Contacts	Eight (8) voltage-free latching contacts are available for remote indication.		
Terminal Board	Double-sealed for maximum protection.		
Heater	Included (Logic card 0.9 W + Display (2.2 W) + Terminal board (0.9 W) Internal powered.		
Paint Finish	Type	Corrosivity category	Typical Environments
	Standard	ISO 12944:2018 C5 High durability/CX	C5 - Industrial areas with high humidity and aggressive atmosphere and coastal and offshore areas with high salinity. CX - Offshore areas with extreme high salinity and Industrial areas with extreme humidity and aggressive atmosphere and tropical atmospheres.
	Special	Upon request	Upon request
Actuator Nameplate	In stainless steel, complete with all the actuator's relevant characteristics. Nameplates in English language.		
Cable Entry Points	Standard	NPT	Number 2 x 1 in. Number 1 x 1 1/2 in. Number 2 x 3/4 in.

Controls

Table 3. Controls (1)

Local Controls	A padlock-able LOCAL/OFF/REMOTE selector switch and OPEN/STOP/CLOSE push-buttons are included for local control of the valve.	
LEDs	LED colors: Green = open/opening Red = close/closing Yellow = alarm/warning Blue = Bluetooth® port active LED colors can be easily changed via the local control interface.	
Bluetooth	Bluetooth port included for easy wireless configuration, diagnostics and control via a PC with Emerson AManager software.	
Remote Control	4 wires (OP, CL, Stop, C/latched) 3 wires (OP, CL, C/push-to-run or latched with instant reverse) 2 wires (NO contact to open or reverse)	
Control Voltage/ Control Inputs	24 V DC, internal supply Not regulated Maximum 4 W	20 to 125 V DC, external supply 20 to 120 V AC, external supply Maximum 25 mA
Remote Output Contacts	Status Open limit Closed limit Position >= xx % Position <= xx % Closing Opening Motor running blinker Mid-travel position Local selected Remote selected Local stop active ESD signal on Manual operation	Alarms Motor over-temperature Over-torque over torque in OP Over-torque in CL Valve jammed in OP Valve jammed in CL Valve jammed Warnings Low lithium battery (if present) Mid-travel alarm in CL/OP Mains-only AS8
Interlock Controls	Two interlock inputs are available to inhibit actuator movement in open or closed direction.	
Emergency Shutdown (ESD)	Emergency shutdown (ESD) command makes the actuator perform the relevant programmed action (requires power supply) Selector in LOCAL Selector in OFF Motor temperature alarm Local STOP push-button Torque alarm	2 speed timer Stay put Move to open position Move to close position Move to preset position
Monitor Relay	Loss of power Loss of one phase Electrical contactor failure Local stop activated Local selector switch in LOCAL/OFF Internal temperature alarm Position sensor Hardware error	Motor temperature alarm Torque alarm Jammed valve Mid-travel alarm Speed sensor configuration error Manual operation ESD signal Low battery
Intelligent Protection	Automatic phase correction Phase failure correction Motor thermostat Jammed valve protection Anti-hammer protection Instantaneous reversal protection	Warnings Contactor failure Maximum torque alarm Torque alarm bypass High/low electronic temperature Opto-coupled remote controls

Table 4. Controls (2)

Upper Display	LCD numeric 3-1/2 digit shows the current valve position as a percentage	
Lower Display	OLED graphic 128 x 64 dots (yellow monochromatic)	
Multiple Languages Display	Possible to choose from the following languages: English, Italian, German, French, Portuguese, Spanish, Russian, Turkish, Norwegian, Romanian and Polish.	
Factory Set Display Menu	English	
Battery	Option A (9 V lithium battery included)	- Local position display active (LCD 3-1/2 digit) - Real-time clock (Back-up) - 4 to 20 mA positioner and relays active Above functionality is also available when MAIN POWER SUPPLY OFF
	Option B (No Battery)	- Local position display active (LCD 3-1/2 digit) - Real-time clock - 4 to 20 mA positioner and Relays active Above functionality is available only when MAIN POWER SUPPLY ON

Standards and Directives

Products have been certified in accordance with the following directives:

- International - IECEx
- FM-c
- USA - FM
- Brazil - INMETRO
- EAC CoC (CU-TR)
- China (CCC)
- United Arab Emirates - ECAS
- Taiwan - ITRI
- United Kingdom - UKCA
- India - C.C.O.E.
- Korea - Kosha
- SIL 2/3

Test Summary

■ Vibration Test

- ICON3000 is in accordance to IEC 60068-2-6 Appendix B (plant induced): frequencies from 1 to 500 Hz (in 3 axes) with 2.0 g peak acceleration. Sweep cycles in each axis: 10 (Performance are guaranteed in case of Anti-vibration KIT option).

■ Seismic Test

- ICON3000 is tested in accordance with IEC 60068-2-57. Frequencies from 1 to 35 Hz (in 3 axes) with max 2.0 g peak acceleration. Verification of structural integrity at 5 g. Endurance of oscillogram: 30 s.

■ Salt Spray Test

- ICON3000 external coating is tested for resistance to salt spray for 1500 hours according to ASTM B117/IEC 68-2-11.

■ Noise Test

- ICON3000 is tested according to EN ISO 1680. Noise level is less than 65 dB (grade A) at 1 m distance.

Applicable Standards and Regulations

■ Electromagnetic compatibility directive (EMC)

- ICON3000 actuators conform to the requirements of EMC Directive 2014/30/EU.

■ Low voltage directive (LV)

- ICON3000 actuators comply with Low Voltage Directive 2014/35/EU.

■ Machinery directive

- ICON3000 actuators comply with the provision of Machinery Directive 2006/42/EC.

■ RED directive

- ICON3000 actuators comply with the RED Directive 2014/53/EU.

■ ATEX directive

- ICON3000 actuators comply with the ATEX Directive 2014/34/EU.

Features and Functions of Actuators

Power Supply Three-Phase AC

**Table 5. Open-Close | Inching Duty
(S2-15') | (S4-25% | 60 St/h)**

Voltage/frequency	220	230	240	380	400	415	-	-	-	AC	Volt
	50	50	50	50	50	50	-	-	-	-	Hz
	-	440	460	480	-	-	-	-	-	AC	Volt
	-	60	60	60	-	-	-	-	-	-	Hz
Special Voltage/frequency	-	440	**460	**480	500	660	690	-	-	AC	Volt
	-	50	**50	**50	50	50	50	-	-	-	Hz
	*208	*220	*280	*380	*400	**415	**690	*575	-	AC	Volt
	*60	*60	*60	*60	*60	**60	**60	*60	-	-	Hz
Type of Duty	Standard S2-15' S4-25%, 60 St/h Class A and B according to EN15714-2 In accordance with IEC 60034_1										
Insulation Class	Standard Class H										

**Table 6. Open-Close | Inching Duty
(S2-30') | (S4-25% | 600 St/h)**

Voltage/frequency	220	230	240	380	400	415	-	-	-	AC	Volt
	50	50	50	50	50	50	-	-	-	-	Hz
	-	440	460	480	-	-	-	-	-	AC	Volt
	-	60	60	60	-	-	-	-	-	-	Hz
Special Voltage/frequency	-	*440	**460	**480	**500	*660	-	**690	-	AC	Volt
	-	*50	**50	**50	**50	*50	-	**50	-	-	Hz
	-	-	*280	**380	*400	**415	**575	**690	-	AC	Volt
	-	-	*60	**60	*60	**60	**60	**60	-	-	Hz
Type of Duty	Standard S2-30' S4-25%, 600 St/h Class A and B according to EN15714-2 In accordance with IEC 60034_1										
Insulation Class	Standard Class H										

NOTE:

For voltage/frequency electric data tables, refer to FCDS-20149-EN.

* Special voltage/frequency using special motor not all are currently been manufactured.

** Special voltage/frequency using special motor available upon request, contact Emerson for details.

Table 7. Modulating Duty
(S4-50% | 1200 St/h)

Voltage/frequency	220	230	240	380	400	415	-	-	-	AC	Volt
	50	50	50	50	50	50	-	-	-	-	Hz
	280	440	460	480	-	-	-	-	-	AC	Volt
	60	60	60	60	-	-	-	-	-	-	Hz
Special Voltage/frequency	-	*440	-	-	-	-	-	-	-	AC	Volt
	-	*50	-	-	-	-	-	-	-	-	Hz
	-	-	-	-	*400	-	-	-	-	AC	Volt
	-	-	-	-	*60	-	-	-	-	-	Hz
Type of Duty	Standard			S4-50% 1200 St/h, Class C according to EN15714-2							
	In accordance with IEC 60034_1										
Insulation Class	Standard			Class H							

NOTE:

* Special voltage/frequency using special motor not all are currently been manufactured, refer to FCDS-20149-EN for electrical data

Power Supply Single-Phase AC

**Table 8. Open-Close | Inching Duty
(S2-15') | (S4-25% | 60 St/h)**

Voltage/frequency	220	230	-	-	-	-	-	-	-	AC	Volt
	50	50	-	-	-	-	-	-	-	-	Hz
	240	-	-	-	-	-	-	-	-	AC	Volt
	60	-	-	-	-	-	-	-	-	-	Hz
Special Voltage/frequency	110	115	-	-	-	-	-	-	-	AC	Volt
	50	50	-	-	-	-	-	-	-	-	Hz
	120	-	-	-	-	-	-	-	-	AC	Volt
	60	-	-	-	-	-	-	-	-	-	Hz
Type of Duty	Standard		S2-15' S4-25%, 60 St/h, Class A and B according to EN15714-2								
	In accordance with IEC 60034_1										
Insulation Class	Standard		Class H								

**Table 9. Modulating Duty
(S4-50% | 1200 St/h)**

Voltage/frequency	220	230	-	-	-	-	-	-	-	AC	Volt
	50	50	-	-	-	-	-	-	-	-	Hz
	240	-	-	-	-	-	-	-	-	AC	Volt
	60	-	-	-	-	-	-	-	-	-	Hz
Special Voltage/frequency	110	115	-	-	-	-	-	-	-	AC	Volt
	50	50	-	-	-	-	-	-	-	-	Hz
	120	-	-	-	-	-	-	-	-	AC	Volt
	60	-	-	-	-	-	-	-	-	-	Hz
Type of Duty	Standard		S4-50% 1200 St/h, Class C according to EN15714-2								
	In accordance with IEC 60034_1										
Insulation Class	Standard		Class H								

Power Supply Direct Current

Table 10. Inching Duty
(S4-25% | 600 St/h)

Voltage	24	-	-	-	-	-	-	-	-	DC	Volt
	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Special Voltage	-	-	-	-	-	-	-	-	-	DC	Volt
	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Type of Duty	Standard	S4-25% 600 St/h, Class C according to EN15714-2									
	In accordance with IEC 60034_1										
Insulation Class	Standard	Class H									

Enclosure and Temperature Rating

Table 11. Non-Hazardous Area Enclosures
WP – Weatherproof

Models	Standard	Rating	Extension	Temperature		
				Standard	Low	Extreme Low
All Models	IEC 60529	IP66/IP68	With or Without	-20 to +85 °C / -4 to +185 °F	-40 to +85 °C / -40 to +185 °F	-60 to +85 °C / -76 to +185 °F
All Models	NEMA (US)	Type 4, 4X, 6	With or Without	-20 to +85 °C / -4 to +185 °F	-40 to +85 °C / -40 to +185 °F	-60 to +85 °C / -76 to +185 °F

Table 12. Hazardous Area Enclosures
European Hazardous Area Directive – ATEX

Models	Directive Code	Enclosure Code	Extension	Motor Duty	Temperature		
					Standard	Low	Extreme Low
All Models	2014/34/EU	II 2G Ex db h IIB T4 Gb or II 2G Ex db h ia IIB T4 Gb II 2D Ex h tb IIIC T135°C Db IP66/68	With or Without	Short time max 60 St/h	-20 to +85 °C / -4 to +185 °F	-40 to +85 °C / -40 to +185 °F	-60 to +85 °C / -76 to +185 °F
				Intermittent > 60 St/h	-20 to +75 °C / -4 to +167 °F	-40 to +75 °C / -40 to +167 °F	-60 to +75 °C / -76 to +167 °F
ICON 010-020	2014/34/EU	II 2G Ex db h IIC T4 Gb or II 2G Ex db h ia IIC T4 Gb II 2D Ex h tb IIIC T135°C Db IP 66/68	Without	Short time max 60 St/h	-20 to +85 °C / -4 to +185 °F	-40 to +85 °C / -40 to +185 °F	-60 to +85 °C / -76 to +185 °F
				Intermittent > 60 St/h	-20 to +75 °C / -4 to +167 °F	-40 to +75 °C / -40 to +167 °F	-60 to +75 °C / -76 to +167 °F
ICON 030-040-050	2014/34/EU	II 2G Ex db h IIB+H2 T4 Gb or II 2G Ex db h ia IIB+H2 T4 Gb II 2D Ex h tb IIIC T135°C Db IP 66/68	Without	Short time max 60 St/h	-20 to +60 °C / -4 to +140 °F	-40 to +60 °C / -40 to +140 °F	-60 to +60 °C / -76 to +140 °F
				Intermittent > 60 St/h	-20 to +60 °C / -4 to +140 °F	-40 to +60 °C / -40 to +140 °F	-60 to +60 °C / -76 to +140 °F
				Short time max 60 St/h	-20 to +60 °C / -4 to +140 °F	-	-
All Models	2014/34/EU	II 2G Ex db eb h IIB T4 Gb or II 2G Ex db eb h ia IIB T4 Gb II 2D Ex h tb IIIC T135°C Db IP 66/68	With or Without	Short time max 60 St/h	-20 to +60 °C / -4 to +140 °F	-	-
				Intermittent > 60 St/h	-20 to +60 °C / -4 to +140 °F	-	-

Table 13. International Certification for Hazardous Area – IECEx

Models	Directive Code	Enclosure Code	Extension	Motor Duty	Standard	Temperature		
						Low	Extreme Low	
All Models	2014/34/EU	Ex db h or db h ia IIB T4 Gb - Ex h tb IIIC T135 °C Db IP66/68	With or Without	Short time max 60 St/h	-20 to +85 °C / -4 to +185 °F	-40 to +85 °C / -40 to +185 °F	-60 to +85 °C / -76 to +185 °F	
				Intermittent > 60 St/h	-20 to +75 °C / -4 to +167 °F	-40 to +75 °C / -40 to +167 °F	-60 to +75 °C / -76 to +167 °F	
ICON 010-020	2014/34/EU	Ex db h or db h ia IIC T4 Gb - Ex h tb IIIC T135 °C Db IP66/68	Without	Short time max 60 St/h	-20 to +85 °C / -4 to +185 °F	-40 to +85 °C / -40 to +185 °F	-60 to +85 °C / -76 to +185 °F	
				Intermittent > 60 St/h	-20 to +75 °C / -4 to +167 °F	-40 to +75 °C / -40 to +167 °F	-60 to +75 °C / -76 to +167 °F	
ICON 030-040-050	2014/34/EU	Ex db h or db h ia IIB+H2 T4 Gb - Ex h tb IIIC T135 °C Db IP66/68	Without	Short time max 60 St/h	-20 to +60 °C / -4 to +140 °F	-40 to +60 °C / -40 to +140 °F	-60 to +60 °C / -76 to +140 °F	
				Intermittent > 60 St/h	-20 to +60 °C / -4 to +140 °F	-40 to +60 °C / -40 to +140 °F	-60 to +60 °C / -76 to +140 °F	
		Ex db h or db h ia IIC T4 Gb - Ex h tb IIIC T135 °C Db IP66/68		Short time max 60 St/h	-20 to +60 °C / -4 to +140 °F	-	-	
				Intermittent > 60 St/h	-20 to +60 °C / -4 to +140 °F	-	-	
All Models	2014/34/EU	Ex db eb h or db eb h ia IIB T4 Gb Ex h tb IIIC T135°C Db IP66/68	With or Without	Short time max 60 St/h	-20 to +60 °C / -4 to +140 °F	-	-	

Table 14. Canadian Standards – CSA

Models	Directive Code	Enclosure Code	Extensions	Motor Duty	Standard	Temperature	
						Low	Extreme Low
All Models	CA (CEC Section 18)	Ex db IIB T4 Gb, Ta, Type 4, 4X, 6	-	-	-20 to +70 °C / -4 to +158 °F	-40 to +70 °C / -40 to +158 °F	-50 to +70 °C / -58 to +158 °F
ICON 010-020	CA (CEC Section 18)	Ex db IIC T4 Gb, Ta, Type 4, 4X, 6	-	-	-20 to +70 °C / -4 to +158 °F	-40 to +70 °C / -40 to +158 °F	-50 to +70 °C / -58 to +158 °F
ICON 030-040-050	CA (CEC Section 18)	Ex db IIC T4 Gb, Ta, Type 4, 4X, 6	Without	All	-20 to +60 °C / -4 to +140 °F	-	-
ICON 030-040-050	CA (CEC Section 18)	Ex db IIB+H2 T4 Gb, Ta, Type 4, 4X, 6	Without	All	-20 to +60 °C / -4 to +140 °F	-	-50 to +60 °C / -58 to +140 °F

NOTES:

Limited availability
ICON3000 is not available at voltages higher than 600 V.

Table 15. USA Standards – Factory Mutual

Models	Coding System	Zone	Enclosure Code	Class	Division	Group	Extension	Motor Duty	Temperature		
									Standard	Low	Extreme Low
All Models	NEC500	-	-	I	1	C, D	-	-	-20 to +70 °C / -4 to +158 °F	-25 to +70 °C / -13 to +158 °F	-
				II	1	E, F, G	-	-			
				III	1	-	-	-			
ICON 10-020	NEC500	-	-	I	1	C, D	-	-	-20 to +70 °C / -4 to +158 °F	-40 to +70 °C / -40 to +158 °F	-
				II	1	E, F, G	-	-			
				III	1	-	-	-			
All Models	NEC505	1	AEx db IIB T4 Gb Ta	-	-	-	-	-	-20 to +70 °C / -4 to +158 °F	-40 to +70 °C / -40 to +158 °F	-50 to +70 °C / -58 to +158 °F
ICON 010-020	NEC505	1	AEx db IIC T4 Gb Ta	-	-	-	-	-	-20 to +70 °C / -4 to +158 °F	-40 to +70 °C / -40 to +158 °F	-50 to +70 °C / -58 to +158 °F
ICON 030-040-050	NEC505	1	AEx db IIC T4 Gb Ta, Type 4, 4X, 6	-	-	-	Without	All	-20 to +60 °C / -4 to +140 °F	-	-
ICON 030-040-050	NEC505	1	AEx db IIB+H2 T4 Gb Ta, Type 4, 4X, 6	-	-	-	Without	All	-20 to +60 °C / -4 to +140 °F	-	-50 to +60 °C / -58 to +140 °F

NOTES:

Limited availability

ICON3000 is not available at voltages higher than 600 V.

Technical Data

Actuator model description is defined by the following coding:

ICON	xx /	yyyy -	zzz
Type	Size	Torque	Speed

ICON	3000	Product Family	
Size	010/020/030/040/050	Model size	-
Torque	30/90/180/360/720/1440	Output nominal torque	N·m
Speed	12/18/24/36/48/72/144 (50 Hz)	Output speed	RPM
-	14/22/29/43/58/86/173 (60 Hz)	-	-
Model Description Example	ICON_010/90-24	-	-

Technical Data for Multi-Turn Actuators

Power Supply Three-Phase AC

Table 16. Open-Close Duty
Short-Time Duty (S2-15') | Inching Duty (S4-25% | 60 St/h)

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type							Hz
	Minimum	Nominal	12	18	24	36	48	72	144	50
			14	22	29	43	58	86	173	60
ICON 010	12 / 9	30 / 22	TM00	TM01	TM10	TM03	TM04	TM05	TM06	-
ICON 010	36 / 27	90 / 66	TM10	TM11	TM12	TM13	TM14	SM15	SM16	-
ICON 020	72 / 53	180 / 133	-	TM13	TM14	SM15	SM21	SM22	SM23	-
ICON 030	144 / 106	360 / 266	SM21	SM32	SM21	-	SM30	SM23	SM31	-
ICON 040	288 / 212	720 / 531	SM30	SM44	SM30	SM40	SM41	SM31	SM42	-
ICON 050	576 / 425	1440 / 1062	SM41	SM40	SM41	SM43	SM50	SM42	SM51	-

Table 17. Short-Time Duty (S2-30')

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type							Hz
			12	18	24	36	48	72	144	50
	Minimum	Nominal	14	22	29	43	58	86	173	60
ICON 010	12 / 9	30 / 22	TM00	TM01	TM10	TM03	TM04	TM05	TM06	-
ICON 010	36 / 27	90 / 66	TM10	TM11	TM12	TM13	TM14	TM15	TM16	-
ICON 020	72 / 53	180 / 133	-	TM13	TM14	TM15	TM21	TM22	TM23	-
ICON 030	144 / 106	360 / 266	-	-	TM21	-	TM30	TM23	TM31	-
ICON 040	288 / 212	720 / 531	-	-	TM30	TM40	-	TM31	-	-

NOTES:

- Output torque Adjustable in OPEN and in CLOSED direction from minimum to nominal values.
- Electric data actuator Refer to FCDS-20149-EN with reference to the Power supply and Motor type.
- SMxx or TMxx Code of the electric motor applied to the actuator model.
- Stall Torque will be up to 2 times the Nominal Torque depending on speed and voltage. Maximum torque/thrust that electric actuator develops when the motor is energized and the output drive is locked.

Table 18. Modulating Duty
Intermittent Periodic Duty (S4-25% | 600 St/h)

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type								Hz
	Minimum	Nominal	12	18	24	36	48	72	144	50	
			14	22	29	43	58	86	173	60	
ICON 010	12 / 9	30 / 22	TM00	TM01	TM10	TM03	TM04	TM05	TM06	-	-
ICON 010	36 / 27	90 / 66	TM10	TM11	TM12	TM13	TM14	TM15	TM16	-	-
ICON 020	72 / 53	180 / 133	-	TM13	TM14	TM15	TM21	TM22	TM23	-	-
ICON 030	144 / 106	360 / 266	-	-	TM21	-	TM30	TM23	TM31	-	-
ICON 040	288 / 212	720 / 531	-	-	TM30	TM40	-	TM31	-	-	-

Table 19. Intermittent Periodic Duty (S4-50% | 1200 St/h)

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type								Hz
	Minimum	Nominal	12	18	24	36	48	72	144	50	
			14	22	29	43	58	86	173	60	
ICON 010R	12 / 9	30 / 22	TM00	TM01	TM10	TM03	TM04	TM05	-	-	-
ICON 010R	36 / 27	90 / 66	TM10	TM11	TM12	TM13	TM14	TM15	-	-	-
ICON 020R	72 / 53	180 / 133	-	TM13	TM14	TM15	TM21	TM22	-	-	-
ICON 030R	144 / 106	360 / 266	-	-	TM21	-	TM30	-	-	-	-
ICON 040R	288 / 212	720 / 531	-	-	TM30	-	-	-	-	-	-

NOTES:

1. Output torque Adjustable in OPEN and in CLOSED direction from minimum to nominal values.
2. Electric data actuator Refer to FCDS-20149-EN with reference to the Power supply and Motor type.
3. SMxx or TMxx Code of the electric motor applied to the actuator model.
4. Stall Torque will be up to 2 times the Nominal Torque depending on speed and voltage. Maximum torque/thrust that electric actuator develops when the motor is energized and the output drive is locked.

Power Supply Single-Phase AC

Table 20. Open-Close Duty - Short-Time Duty (S2-15') | Inching Duty (S4-25% | 60 St/h)
Power Supply 220/230/240 V, 50/60 Hz

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type		
	Minimum	Nominal	From	To	Motor
ICON 010	12 / 9	30 / 22	8	17	TM11
ICON 010	12 / 9	30 / 22	24	72	TM15
ICON 010	12 / 9	30 / 22	73	172	TM16
ICON 010	36 / 27	90 / 66	6	23	TM13
ICON 010	36 / 27	90 / 66	24	95	TM18
ICON 010	36 / 27	90 / 66	96	120	TM16
ICON 020	72 / 53	180 / 133	12	36	TM22
ICON 020	72 / 53	180 / 133	48	60	TM22
ICON 030	144 / 106	360 / 266	10	30	TM30

Table 21. Power Supply 110/115/120 V, 50/60 Hz

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type		
	Minimum	Nominal	From	To	Motor
ICON 010	12 / 9	30 / 22	8	17	TM11
ICON 010	12 / 9	30 / 22	18	62	TM14
ICON 010	12 / 9	30 / 22	63	94	TM15
ICON 010	36 / 27	90 / 66	6	23	TM13
ICON 010	36 / 27	90 / 66	24	40	TM14
ICON 020	72 / 53	180 / 133	8	20	TM21

NOTES:

- Output torque Adjustable in OPEN and in CLOSED direction from minimum to nominal values.
- Electric data actuator Refer to Electric Data Document FCDS-20149-EN with reference to the Power supply and Motor type.
- SMxx or TMxx Code of the electric motor applied to the actuator model.
- Stall Torque will be up to 2 times the Nominal Torque depending on speed and voltage. Maximum torque/thrust that electric actuator develops when the motor is energized and the output drive is locked.

Table 22. Modulating Duty - Intermittent Periodic Duty (S4-50% | 1200St/h)
Power Supply 220/230/240 V, 50/60 Hz

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type		
	Minimum	Nominal	From	To	Motor
ICON 010R	12 / 9	30 / 22	8	17	TM11
ICON 010R	12 / 9	30 / 22	24	72	TM15
ICON 010R	12 / 9	30 / 22	73	172	TM16
ICON 010R	36 / 27	90 / 66	6	23	TM13
ICON 010R	36 / 27	90 / 66	24	95	TM18
ICON 020R	72 / 53	180 / 133	12	36	TM22
ICON 020R	72 / 53	180 / 133	48	60	TM22
ICON 030R	144 / 106	360 / 266	10	30	TM30

Table 23. Power Supply 110/115/120 V, 50/60 Hz

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type		
	Minimum	Nominal	From	To	Motor
ICON 010R	12 / 9	30 / 22	8	17	TM11
ICON 010R	12 / 9	30 / 22	18	62	TM14
ICON 010R	12 / 9	30 / 22	63	94	TM15
ICON 010R	36 / 27	90 / 66	6	23	TM13
ICON 010R	36 / 27	90 / 66	24	40	TM14
ICON 020R	72 / 53	180 / 133	8	20	TM21

NOTES:

1. Output torque Adjustable in OPEN and in CLOSED direction from minimum to nominal values.
2. Electric data actuator Refer to Electric Data Document FCDS-20149-EN with reference to the Power supply and Motor type.
3. SMxx or TMxx Code of the electric motor applied to the actuator model.
4. Stall Torque will be up to 2 times the Nominal Torque depending on speed and voltage. Maximum torque/thrust that electric actuator develops when the motor is energized and the output drive is locked.

Power Supply Direct Current

Table 24. Modulating Duty - Intermittent Periodic Duty (S4-25% | 600 St/h)
Power Supply 24 V DC

Type	Output Torque ⁽⁴⁾ N·m / lbf·ft		Operating Speed (RPM)/Motor Type		
	Minimum	Nominal	From	To	Motor
ICON 010D	12 / 9	30 / 22	12	29	DM05d
ICON 010D	12 / 9	30 / 22	30	60	DM05d
ICON 010D	36 / 27	90 / 66	12	29	DM05
ICON 010D	36 / 27	90 / 66	24	30	DM05
ICON 010D	36 / 27	90 / 66	50	68	DM05

NOTES:

1. Output torque Adjustable in OPEN and in CLOSED direction from minimum to nominal values.
2. Electric data actuator Refer to Electric Data Document, FCDS-20149-EN with reference to the Power supply and Motor type.
3. DMxx Code of the electric motor applied to the actuator model.
4. Stall Torque will be up to 2 times the Nominal Torque depending on speed and voltage. Maximum torque/thrust that electric actuator develops when the motor is energized and the output drive is locked.

Controls

Analog Module

Analog Position Transmission Module (APTM)

This card features a 4 to 20 mA galvanically-insulated module for position or torque re-transmission. The said card is easily plugged into the base card without the need for dedicated tools. The module can be configured to the output torque in place of the actuator position.

Position Servo Amplifier Module (PSM)

Module necessary for actuators in modulating and inching duty. It drives the motor through pulses at constant frequency and duration proportional to the position error, following an externally-set analogical point signal.

The basic features are:

- Input: 4 to 20 mA or 0 to 20 mA with galvanic insulation.
- Output: 4 to 20 mA with galvanic insulation for position or torque re-transmission.

Bus Control Modules

Table 25. FOUNDATION Fieldbus

Electrical interface	IEC 61158-2, 2-wire communication
Data rate	31.25 kbit/s
Bus type	H1 communication bus, Voltage Mode signaling
Device number	32 devices per segment Maximum 16 devices (best practice) even less in case of many Function Blocks assigned to the microcycle
Bus length:	1900 m per segment
Electrical power:	Bus-powered Maximum voltage 32 V Minimum voltage 9 V Rated current $I_n = 19$ mA Fault current $I_{max} = 24$ mA

TABLE 26. HART 7

Electrical interface	4 to 20 mA analog loop, 2-wire communication
Data rate	Request/response mode - 2/3 updates per second Optional burst mode - 3/4 updates per second
Bus type	HART® protocol 7.9
Device number	Point-to-point architecture: 1 field device Split ranging: normally 2 field devices Multidrop: 16 field devices
Bus length	Maximum twisted pair length - 3048 m / 10,000 ft Maximum multiple twisted pair length - 1524 m / 5000 ft
Electrical power	Actuator powered Maximum voltage 36 V Minimum voltage 0 V

Table 27. Modbus RTU

Electrical interface	2-wire RS-485
Data rate	600, 1200, 2400, 4800, 9600, 19200, 38400 bit/s Redundant type: number 2 separate and configurable channels with dedicated speed
Transmission technology	RS-485, half duplex
Device number	Maximum 32 devices per segment. If more than 32 devices are present on the bus, repeaters should be used Maximum addresses 247
Network topology	Line (bus) structure
Bus length	1200 m without repeater
Electrical power	Actuator-powered

Table 28. Profibus DP V0/1/2

Electrical interface	2-wire RS-485								
Data rate	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500 kbit/s								
Network topology	Line (bus) structure. With repeaters tree structures can also be realized								
Device number	32 devices per segment without repeater (maximum 126 with repeaters)								
Transmission technology	Profibus DP								
Bus length	Dependent on bus speed selected								
	Bus speed:	9.6	19.2	45.45	93.75	187.5	500	1500	kbit/s
	Length:	1200				200	200	200	m
Electrical power	Actuator-powered (optional auxiliary external voltage supply)								
Station type	DPV1 and DPV2 (redundancy) slave								

Table 29. LonWorks

Electrical interface	2-wire twisted pair
Data rate	78 kbps
Network topology	Multi-drop line or loop
Device number	60 devices per segment using specific 16 AWG cable. More segments with repeaters
Transmission technology	LonWorks® FT-10
Bus length	800 m per segment using specific 16 AWG cable. More segments with repeaters
Electrical power	Actuator-powered

Overall Actuator Dimensions

Overall Dimensions - Standard Manual Override

Figure 1. Standard Manual Override

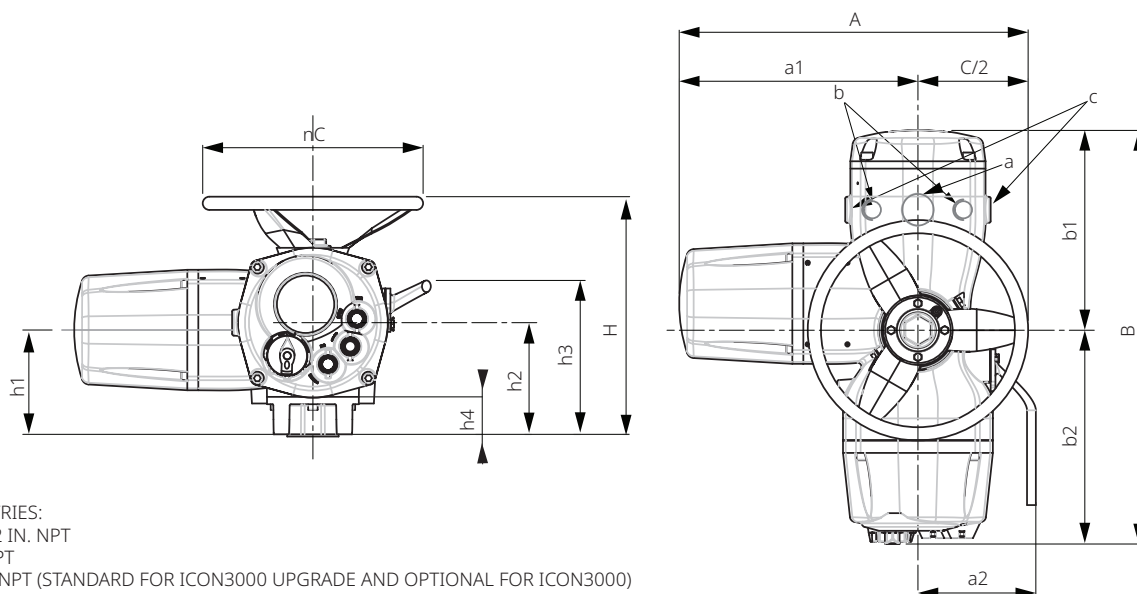


Table 30. Overall Dimensions (mm / in.)

Model ICON3000 (Upgrade)	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	kg / lb	F
ICON_010	489 / 19.25	328 / 12.91	161 / 6.34	566 / 22.28	274 / 10.79	292 / 11.50	300 / 11.81	324 / 12.76	142 / 5.59	152 / 5.98	209 / 8.23	38 / 83.78	F10
ICON_020	600 / 23.62	350 / 13.78	161 / 6.34	584 / 22.99	284 / 11.18	300 / 11.81	500 / 19.69	374 / 14.72	161 / 6.34	161 / 6.34	240 / 9.45	48 / 105.82	F14
ICON_030	705 / 27.76	405 / 15.94	160 / 6.30	625 / 24.61	314 / 12.36	312 / 12.28	600 / 23.62	431 / 16.97	187 / 7.36	175 / 6.89	270 / 10.63	77 / 169.76	F14
ICON_040	821 / 32.32	461 / 18.15	170 / 6.69	710 / 27.95	319 / 12.56	392 / 15.43	720 / 28.35	478 / 18.82	196 / 7.72	191 / 7.52	291 / 11.46	90 / 198.42	F16
ICON_50	941 / 37.05	511 / 20.12	180 / 7.09	761 / 29.96	364 / 14.33	397 / 15.63	860 / 33.86	549 / 21.61	223 / 8.78	218 / 8.58	336 / 13.23	120 / 264.55	F25

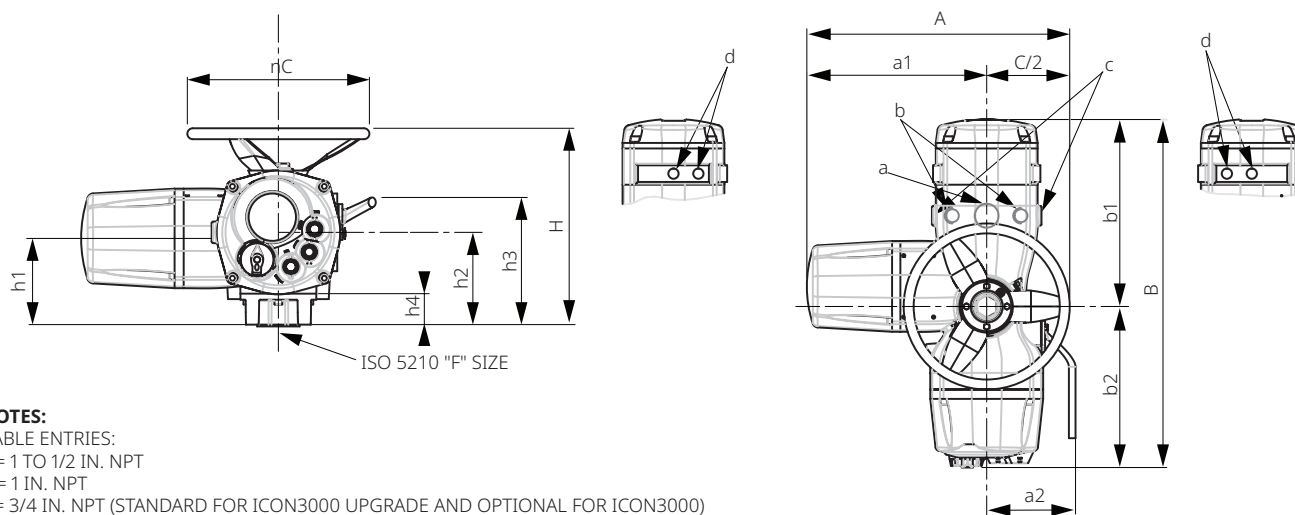
Table 31. Overall Dimensions (mm / in.)

Model ICON3000	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	kg / lb	F
ICON_010	484 / 19.06	325 / 12.80	159 / 6.26	561 / 22.09	273 / 10.75	288 / 11.34	300 / 11.81	332 / 13.07	142 / 5.59	152 / 5.98	209 / 8.23	32 / 70.55	F10
ICON_020	597 / 23.50	347 / 13.66	159 / 6.26	579 / 22.80	283 / 11.14	296 / 11.65	500 / 19.69	380 / 14.96	161 / 6.34	161 / 6.34	239 / 9.41	45 / 99.21	F14
ICON_030	699 / 27.52	399 / 15.71	159 / 6.26	621 / 24.45	313 / 12.32	308 / 12.13	600 / 23.62	436 / 17.17	175 / 6.89	175 / 6.89	269 / 10.59	70 / 154.32	F14
ICON_040	815 / 32.09	455 / 17.91	159 / 6.26	706 / 27.80	318 / 12.52	388 / 15.28	720 / 28.35	486 / 19.13	196 / 7.72	191 / 7.52	291 / 11.46	86 / 189.60	F16
ICON_050	958 / 37.72	528 / 20.79	159 / 6.26	756 / 29.76	363 / 14.29	393 / 15.47	860 / 33.86	560 / 22.05	223 / 8.78	218 / 8.58	336 / 13.23	110 / 242.51	F25

NOTES:
ISO 5210 Mounting Scheme - Column F

Overall Dimensions - Optional Profibus Module With Standard Manual Override

Figure 2. Optional Profibus Module with Standard Manual Override



NOTES:
CABLE ENTRIES:
a = 1 TO 1/2 IN. NPT
b = 1 IN. NPT
c = 3/4 IN. NPT (STANDARD FOR ICON3000 UPGRADE AND OPTIONAL FOR ICON3000)
d = N.6/N.9 1/2 IN. NPT/M20X1.5 (OPTIONAL)

Table 32. Overall Dimensions (mm / in.)

Model ICON3000 (Upgrade)	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	kg / lb	F
ICON_010	489 / 19.25	328 / 12.91	161 / 6.34	631 / 24.84	339 / 13.35	292 / 11.50	300 / 11.81	324 / 12.76	142 / 5.59	152 / 5.98	209 / 8.23	44 / 97.00	F10
ICON_020	600 / 23.62	350 / 13.78	161 / 6.34	649 / 25.55	349 / 13.74	300 / 11.81	500 / 19.69	374 / 14.72	161 / 6.34	161 / 6.34	240 / 9.45	54 / 119.05	F14
ICON_030	705 / 27.76	405 / 15.94	160 / 6.30	691 / 27.20	379 / 14.92	312 / 12.28	600 / 23.62	431 / 16.97	187 / 7.36	175 / 6.89	270 / 10.63	83 / 182.98	F14
ICON_040	821 / 32.32	461 / 18.15	170 / 6.69	776 / 30.55	384 / 15.12	392 / 15.43	720 / 28.35	478 / 18.82	196 / 7.72	191 / 7.52	291 / 11.46	96 / 211.64	F16
ICON_050	941 / 37.05	511 / 20.12	180 / 7.09	826 / 32.52	429 / 16.89	397 / 15.63	860 / 33.86	549 / 21.61	223 / 8.78	218 / 8.58	336 / 13.23	126 / 277.78	F25

Table 33. Overall Dimensions (mm / in.)

Model ICON3000	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	kg / lb	F
ICON_010	484 / 19.06	325 / 12.80	159 / 6.26	627 / 24.69	339 / 13.35	288 / 11.34	300 / 11.81	332 / 13.07	142 / 5.59	152 / 5.98	209 / 8.23	38 / 83.78	F10
ICON_020	597 / 23.50	347 / 13.66	159 / 6.26	645 / 25.39	349 / 13.74	296 / 11.65	500 / 19.69	380 / 14.96	161 / 6.34	161 / 6.34	239 / 9.41	51 / 112.44	F14
ICON_030	699 / 27.52	399 / 15.71	159 / 6.26	687 / 27.05	379 / 14.92	308 / 12.13	600 / 23.62	436 / 17.17	175 / 6.89	175 / 6.89	269 / 10.59	76 / 167.55	F14
ICON_040	815 / 32.09	455 / 17.91	159 / 6.26	772 / 30.39	384 / 15.12	388 / 15.28	720 / 28.35	486 / 19.13	196 / 7.72	191 / 7.52	291 / 11.46	92 / 202.83	F16
ICON_050	958 / 37.72	528 / 20.79	159 / 6.26	825 / 32.48	432 / 17.01	393 / 15.47	860 / 33.86	560 / 22.05	223 / 8.78	218 / 8.58	336 / 13.23	116 / 255.74	F25

NOTE:
ISO 5210 Mounting Scheme - Column F

Overall Dimensions - Reduced Manual Override

Figure 3. Reduced Manual Override

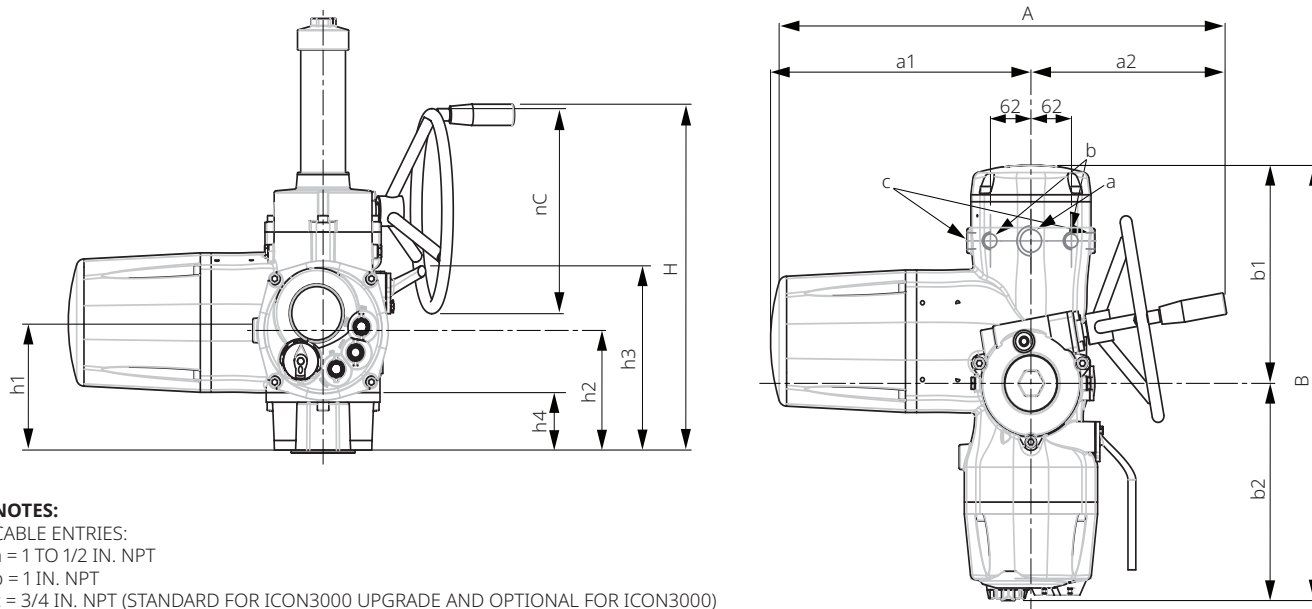


Table 34. Overall Dimensions (mm / in.)

Model ICON3000 (Upgrade)	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	kg / lb	F
ICON_030	700 / 27.56	405 / 15.94	295 / 11.61	625 / 24.61	314 / 12.36	312 / 12.28	300 / 11.81	506 / 19.92	187 / 7.36	175 / 6.89	270 / 10.63	85 / 187.39	F14
ICON_040	783 / 30.83	461 / 18.15	322 / 12.68	710 / 27.95	319 / 12.56	392 / 15.43	400 / 15.75	580 / 22.83	196 / 7.72	191 / 7.52	291 / 11.46	98 / 216.05	F16
ICON_050	825 / 32.48	511 / 20.12	314 / 12.36	761 / 29.96	364 / 14.33	397 / 15.63	500 / 19.69	691 / 27.20	223 / 8.78	218 / 8.58	336 / 13.23	128 / 282.19	F25

Table 35. Overall Dimensions (mm / in.)

Model ICON3000	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	Manual Override R:	kg / lb
ICON_030	648 / 25.51	399 / 15.71	249 / 9.80	621 / 24.45	313 / 12.32	308 / 12.13	300 / 11.81	500 / 19.69	175 / 6.89	175 / 6.89	269 / 10.59	10/1	78 / 171.96
ICON_040	723 / 28.46	455 / 17.91	268 / 10.55	706 / 27.80	318 / 12.52	388 / 15.28	400 / 15.75	574 / 22.60	196 / 7.72	191 / 7.52	291 / 11.46	13/1	94 / 207.23
ICON_050	799 / 31.46	528 / 20.79	271 / 10.67	756 / 29.76	363 / 14.29	393 / 15.47	500 / 19.69	685 / 26.97	223 / 8.78	218 / 8.58	336 / 13.23	17/1	118 / 260.15

Overall Dimensions - Optional Profibus Module With Reduced Manual Override

Figure 4. Optional Profibus Module with Reduced Manual Override

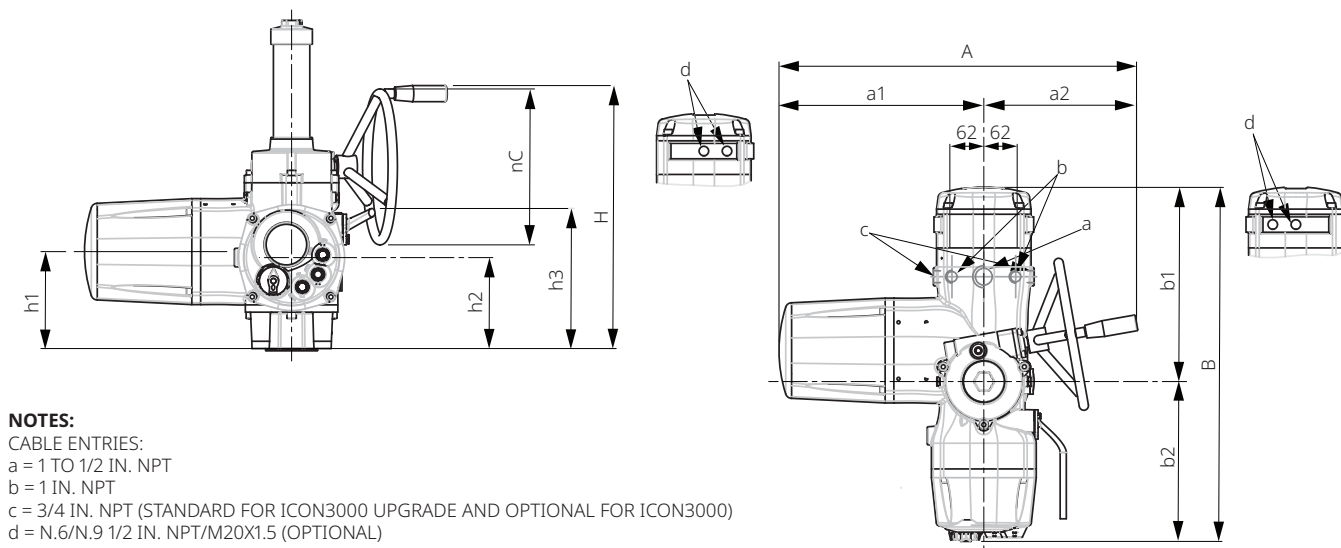


Table 36. Overall Dimensions (mm / in.)

Model ICON3000 (Upgrade)	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	kg / lb	F
ICON_030	700 / 27.56	405 / 15.94	295 / 11.61	691 / 27.20	379 / 14.92	312 / 12.28	300 / 11.81	506 / 19.92	187 / 7.36	175 / 6.89	270 / 10.63	91 / 41.28	F14
ICON_040	783 / 30.83	461 / 18.15	322 / 12.68	776 / 30.55	384 / 15.12	392 / 15.43	400 / 15.75	580 / 22.83	196 / 7.72	191 / 7.52	291 / 11.46	104 / 47.17	F16
ICON_050	825 / 32.48	511 / 20.12	314 / 12.36	826 / 32.52	429 / 16.89	397 / 15.63	500 / 19.69	691 / 27.20	223 / 8.78	218 / 8.58	336 / 13.23	134 / 60.78	F25

Table 37. Overall Dimensions (mm / in.)

Model ICON3000	A	a1	a2	B	b1	b2	C	H	h1	h2	h3	Manual Override R:	kg / lb
ICON_030	648 / 25.51	399 / 15.71	249 / 9.80	687 / 27.05	379 / 14.92	308 / 12.13	300 / 11.81	500 / 19.69	175 / 6.89	175 / 6.89	269 / 10.59	10/1	84 / 185.19
ICON_040	723 / 28.46	455 / 17.91	268 / 10.55	772 / 30.39	384 / 15.12	388 / 15.28	400 / 15.75	574 / 22.6	196 / 7.72	191 / 7.52	291 / 11.46	13/1	100 / 220.46
ICON_050	799 / 31.46	528 / 20.79	271 / 10.67	822 / 32.36	429 / 16.89	393 / 15.47	500 / 19.69	685 / 26.97	223 / 8.78	218 / 8.58	336 / 13.23	17/1	124 / 273.37

Output Drive Dimensions

Output Drive Type A Dimensions

Figure 5. Output Drive Type A Dimensions

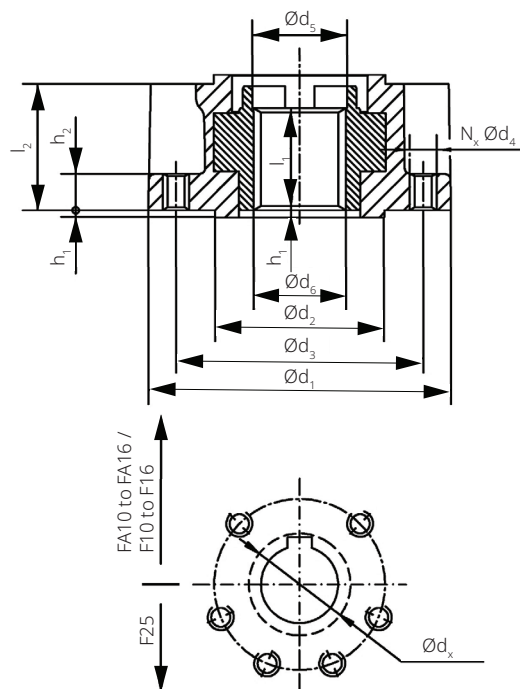


Table 38. Output Drive Type A Dimensions (1)

Model ISO 5210	010 F10	020 F14	030 F14	040 F16	050 F25
F _{nom} (kN / lbf)	40 / 8992.36	100 / 22480.90	150 / 33721.35	180 / 40465.62	300 / 67442.70
F _{max} (kN / lbf)	60 / 13488.54	150 / 33721.35	225 / 50582.03	270 / 60698.43	450 / 101164.05
$\varnothing d_1$	125 / 4.92	175 / 6.89	175 / 6.89	210 / 8.27	300 / 11.81
$\varnothing d_2$ f8	70 / 2.76	100 / 3.94	100 / 3.94	130 / 5.12	200 / 7.87
$\varnothing d_3$	102 / 4.02	140 / 5.51	140 / 5.51	165 / 6.50	254 / 10.00
$\varnothing d_4$	M10	M16	M16	M20	M16
$\varnothing d_5$	33 / 1.30	46 / 1.81	62 / 2.44	68 / 2.68	78 / 3.07
$\varnothing d_6$ not machined ⁽¹⁾	BLIND	BLIND	BLIND	30 / 1.18	35 / 1.38
$\varnothing d_6$ max	32 / 1.26	45 / 1.77	60.5 / 2.38	65 / 2.56	76.5 / 3.01
$\varnothing d_x$ max	32 / 1.26	45 / 1.77	60.5 / 2.38	65 / 2.56	76.5 / 3.01
I ₁	44 / 1.73	55 / 2.17	70 / 2.76	75 / 2.95	92 / 3.62
I ₂	51 / 2.01	68 / 2.68	84 / 3.31	94 / 3.70	120 / 4.72
h ₁	3 / 0.12	4 / 0.16	4 / 0.16	5 / 0.20	5 / 0.20
h ₂	15 / 0.59	24 / 0.94	24 / 0.94	30 / 1.18	24 / 0.94
N	4	4	4	4	8
Weight (kg / lb)	1.5 / 3.4	7.7 / 17	7.7 / 17	15 / 34	28 / 62

Table 39. Output Drive Type A Dimensions (2)

Model MSS SP-102	010 FA10	020 FA14	030 FA14	040 FA16	050 FA25
F _{nom} (kN / lbf)	40 / 8992.36	100 / 22480.90	150 / 33721.35	180 / 40465.62	300 / 67442.70
F _{max} (kN / lbf)	60 / 13488.54	150 / 33721.35	225 / 50582.03	270 / 60698.43	450 / 101164.05
$\varnothing d_1$	125 / 4.92	175 / 6.89	175 / 6.89	210 / 8.27	300 / 11.81
$\varnothing d_2$ f8	58.7 / 2.31	95.25 / 3.75	95.25 / 3.75	127 / 5.00	152 / 5.98
$\varnothing d_3$	101.6 / 4.00	139.7 / 5.50	139.7 / 5.50	165.1 / 6.50	254.4 / 10.02
$\varnothing d_4$ (UNC)	3/8-16	5/8-11	5/8-11	3/4-10	5/8-11
$\varnothing d_5$	33 / 1.30	46 / 1.81	62 / 2.44	68 / 2.68	78 / 3.07
$\varnothing d_6$ not machined ⁽¹⁾	BLIND	BLIND	BLIND	30 / 1.18	35 / 1.38
$\varnothing d_6$ max	32 / 1.26	45 / 1.77	60.5 / 2.38	65 / 2.56	76.5 / 3.01
$\varnothing d_x$ max	32 / 1.26	45 / 1.77	60.5 / 2.38	65 / 2.56	76.5 / 3.01
I ₁	44 / 1.73	55 / 2.17	70 / 2.76	75 / 2.95	92 / 3.62
I ₂	51 / 2.01	68 / 2.68	84 / 3.31	94 / 3.70	120 / 4.72
h ₁	3 / 0.12	4 / 0.16	4 / 0.16	5 / 0.20	5 / 0.20
h ₂	15 / 0.59	24 / 0.94	24 / 0.94	30 / 1.18	24 / 0.94
N	4	4	4	4	8
Weight (kg / lb)	1.5 / 3.4	7.7 / 17	7.7 / 17	15 / 34	28 / 62

NOTES:

- $\varnothing d_6$ max = Maximum threaded stem acceptable.
- $\varnothing d_x$ = The maximum accepted diameter as prescribed by the key.
- F_{nom} = The maximum thrust applicable to the ICON3000 block type "A" for DYNAMIC CONDITIONS with torque control set at 100%.
- F_{max} = The maximum thrust applicable to the ICON3000 block type "A" for STATIC CONDITIONS with manual override or with motor at stall torque.
- All units are in mm / in. unless otherwise stated.

(1) Pre-holes model are available on request.

Thrust Block Assembly

Figure 6. Thrust Block Assembly

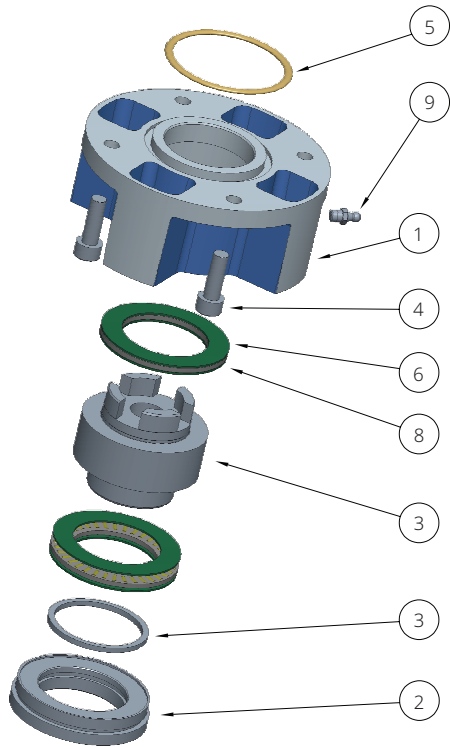
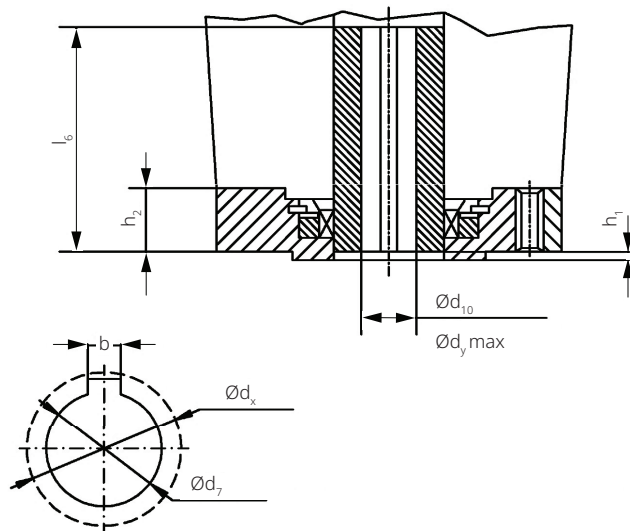


Table 40. Thrust Block Assembly

Item	Quantity	Description	Material	Part Number
1	1	Thrust block	Cast iron	3800100400
2	1	Seal locking ring	Carbon steel	3800100410
3	1	Bush	Bronze	3800100430
4	4	Screw	Stainless steel	8058212000
5	1	O-ring	Nitrile Butadiene Rubber (NBR)	8092141000
6	4	Thrust bearing washer	Alloy steel	8411045000
7	1	Q-ring	NBR	8800914133
8	1	Axial bearing	Carbon steel	8854001000
9	1	Greaser	Carbon steel	8870120000

Output Drive Type B3/B4 Dimensions

Figure 7. Output Drive Type B3/B4 Dimensions



NOTES:

* Flange dimensions as per type A

Table 41. Output Drive Type B3/B4 Dimensions (1)

Model ISO 5210	010 F10	020 F14	030 F14	040 F16	050 F25
B3 Ød ₁₀ H9 ⁽¹⁾	20 / 0.79	30 / 1.18	30 / 1.18	40 / 1.57	50 / 1.97
Key size (bxh)	6x6 / 0.24x0.24	8x7 / 0.31x0.28	8x7 / 0.31x0.28	12x8 / 0.47x0.31	14x9 / 0.55x0.35
B4 Ød _y max ⁽¹⁾	22 / 0.87	32 / 1.26	46 / 1.81	50 / 1.97	58 / 2.28
Ød _x ⁽²⁾	26 / 1.02	40 / 1.57	55 / 2.17	60 / 2.36	68 / 2.68
I ₆	100 / 3.94	120 / 4.72	130 / 5.12	150 / 5.91	178 / 7.01
h ₁	3 / 0.12	4 / 0.16	4 / 0.16	5 / 0.20	5 / 0.20
h ₂	15 / 0.59	24 / 0.94	24 / 0.94	30 / 1.18	24 / 0.94
N	4	4	4	4	8
Weight (kg / lb)	1.0 / 2.2	5.6 / 12	6.1 / 13	12 / 27	20 / 45

Table 42. Output Drive Type B3/B4 Dimensions (2)

Model MSS SP-102	010 FA10	020 FA14	030 FA14	040 FA16	050 FA25
B3 Ød ₁₀ H9 ⁽¹⁾	20 / 0.79	30 / 1.18	30 / 1.18	40 / 1.57	50 / 1.97
Key size (bxh)	6x6 / 0.24x0.24	8x7 / 0.31x0.28	8x7 / 0.31x0.28	12x8 / 0.47x0.31	14x9 / 0.55x0.35
B4 Ød _y max ⁽¹⁾	22 / 0.87	32 / 1.26	46 / 1.81	50 / 1.97	58 / 2.28
Ød _x ⁽²⁾	26 / 1.02	40 / 1.57	55 / 2.17	60 / 2.36	68 / 2.68
I ₆	100 / 3.94	120 / 4.72	130 / 5.12	150 / 5.91	178 / 7.01
h ₁	0.1 / 0.00	0.2 / 0.01	0.2 / 0.01	0.2 / 0.01	0.2 / 0.01
h ₂	0.6 / 0.02	0.9 / 0.04	0.9 / 0.04	1.2 / 0.05	0.9 / 0.04
N	4	4	4	4	8
Weight (kg / lb)	1.0 / 2.2	5.6 / 12	6.1 / 13	12 / 27	20 / 45

NOTES:

■ B3 coupling bush is machined in accordance to the above indications.

■ All units are in mm / in. unless otherwise stated.

(1) Ød₁₀ and Ød_y with standard keyway according to ISO 773.

(2) Ød_x = The maximum accepted diameter described by the key.

Thrust Block Type B3/B4

Figure 8. Thrust Block Type B3/B4

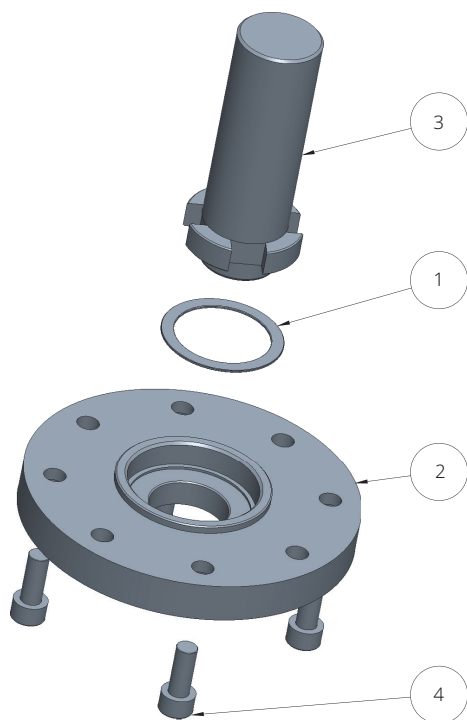
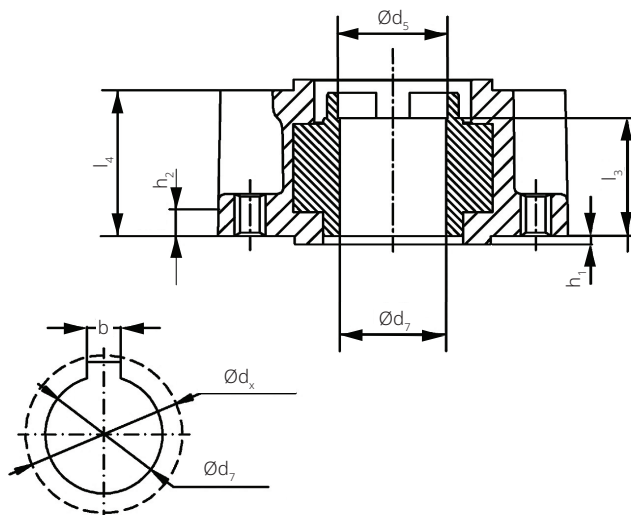


Table 43. Output Drive Type B3/B4 Dimensions

Item	Quantity	Description	Material	Part Number
1	1	Washer	-	3500050300
2	1	Flange	Carbon steel	3800100460
3	1	Bush	Cast iron	3800100470
4	4	Screw	Stainless steel	8058210000

Output Drive Type B5/B6 Dimensions

Figure 9. Output Drive Type B5/B6 Dimensions



NOTES:

* Flange dimensions as per type A

Table 44. Output Drive Type B5/B6 Dimensions (1)

Model ISO 5210	010 F10	020 F14	030 F14	040 F16	050 F25
$\varnothing d_5$	33 / 1.30	46 / 1.81	62 / 2.44	68 / 2.68	78 / 3.07
B5 $\varnothing d_7$ H9 ⁽¹⁾	32 / 1.26	45 / 1.77	60 / 2.36	65 / 2.56	76 / 2.99
Key size (bxh)	12x8 / 0.47x0.31	18x11 / 0.71x0.43	18x11 / 0.71x0.43	22x14 / 0.87x0.55	28x16 / 1.10x0.63
B6 $\varnothing d_7$ max ⁽¹⁾	32 / 1.26	45 / 1.77	60 / 2.36	65 / 2.56	76 / 2.99
$\varnothing d_x$ max ⁽²⁾	40 / 1.57	54.4 / 2.14	71 / 2.80	76 / 2.99	90 / 3.54
I_3	44 / 1.73	55 / 2.17	70 / 2.76	73 / 2.87	92 / 3.62
I_4	51 / 2.01	68 / 2.68	84 / 3.31	94 / 3.70	120 / 4.72
h_1	3 / 0.12	4 / 0.16	4 / 0.16	5 / 0.20	5 / 0.20
h_2	15 / 0.59	24 / 0.94	24 / 0.94	30 / 1.18	24 / 0.94
N	4	4	4	4	8
Weight (kg / lb)	1.5 / 3.4	6.6 / 15	7.1 / 16	14 / 31	27 / 58

Table 45. Output Drive Type B5/B6 Dimensions (2)

Model MSS SP-102	010 FA10	020 FA14	030 FA14	040 FA16	050 FA25
$\varnothing d_5$	33 / 1.30	46 / 1.81	62 / 2.44	68 / 2.68	78 / 3.07
B5 $\varnothing d_7$ H9 ⁽¹⁾	32 / 1.26	45 / 1.77	60 / 2.36	65 / 2.56	76 / 2.99
Key size (bxh)	12x8 / 0.47x0.31	18x11 / 0.71x0.43	18x11 / 0.71x0.43	22x14 / 0.87x0.55	28x16 / 1.10x0.63
B6 $\varnothing d_7$ max ⁽¹⁾	32 / 1.26	45 / 1.77	60 / 2.36	65 / 2.56	76 / 2.99
$\varnothing d_x$ max ⁽²⁾	40 / 1.57	54.4 / 2.14	71 / 2.80	76 / 2.99	90 / 3.54
I_3	44 / 1.73	55 / 2.17	70 / 2.76	73 / 2.87	92 / 3.62
I_4	51 / 2.01	68 / 2.68	84 / 3.31	94 / 3.70	120 / 4.72
Weight (kg / lb)	1.5 / 3.4	6.6 / 15	7.1 / 16	14 / 31	27 / 58

NOTES:

- All units are in mm / in. unless otherwise stated.
- B5 coupling bush is machined in accordance to the above indications.

(1) $\varnothing d_7$ with standard keyway according to ISO 773.

(2) $\varnothing d_x$ = The maximum acceptable diameter described by the key.

Thrust Block Type B5/B6

Figure 10. Thrust Block Type B5/B6

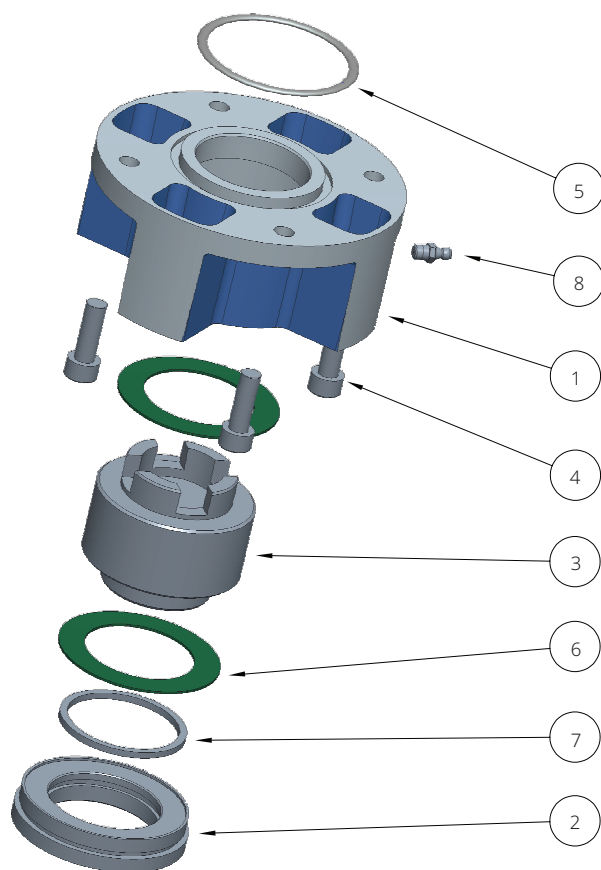
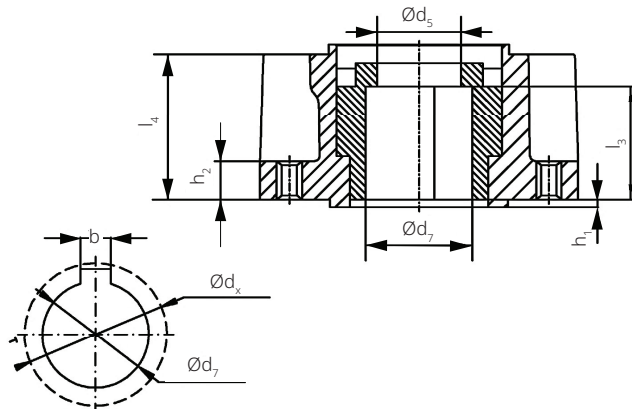


Table 46. Output Drive Type B5/B6 Dimensions

Item	Quantity	Description	Material	Part Number
1	1	Thrust block	Cast iron	3800100400
2	1	Seal locking ring	Bronze	3800100411
3	1	Bush	Carbon steel	3800102450
4	4	Screw	Stainless steel	8058212000
5	1	O-ring	NBR	8092141000
6	2	Thrust bearing washer	Alloy steel	8411045000
7	1	Q-ring	NBR	8800914133
8	1	Greaser	Carbon steel	8870120000

Output Drive Type B7/B8 Dimensions

Figure 11. Output Drive Type B7/B8 Dimensions



NOTES:

* Flange dimensions as per type A

Table 47. Output Drive Type B7/B8 Dimensions (1)

Model ISO 5210	010 F10	020 F14	030 F14	040 F16	050 F25
$\varnothing d_5$	33 / 1.30	46 / 1.81	62 / 2.44	68 / 2.68	78 / 3.07
B7 $\varnothing d_7$ H9 ⁽¹⁾	42 / 1.65	60 / 2.36	60 / 2.36	80 / 3.15	100 / 3.94
Key size (bxh)	12x8 / 0.47x0.31	18x11 / 0.71x0.43	18x11 / 0.71x0.43	22x14 / 0.87x0.55	28x16 / 1.10x0.63
B8 $\varnothing d_7$ max ⁽¹⁾	42 / 1.65	60 / 2.36	60 / 2.36	80 / 3.15	100 / 3.94
$\varnothing d_x$ max ⁽²⁾	50 / 1.97	71 / 2.80	71 / 2.80	94 / 3.70	116 / 4.57
I_3	40 / 1.57	48 / 1.89	70 / 2.76	66 / 2.60	76 / 2.99
I_4	51 / 2.01	68 / 2.68	84 / 3.31	94 / 3.70	120 / 4.72
h_1	3 / 0.12	4 / 0.16	4 / 0.16	5 / 0.20	5 / 0.20
h_2	15 / 0.59	24 / 0.94	24 / 0.94	30 / 1.18	24 / 0.94
N	4	4	4	4	8
Weight (kg / lb)	1.5 / 3.4	6.6 / 15	7.1 / 16	14 / 31	27 / 58

Table 48. Output Drive Type B7/B8 Dimensions (2)

Model MSS SP-102	010 FA10	020 FA14	030 FA14	040 FA16	050 FA25
$\varnothing d_5$	NA*	46 / 1.81	62 / 2.44	68 / 2.68	78 / 3.07
B7 $\varnothing d_7$ H9 ⁽¹⁾	NA*	60 / 2.36	60 / 2.36	80 / 3.15	100 / 3.94
Key size (bxh)	NA*	18x11 / 0.71x0.43	18x11 / 0.71x0.43	22x14 / 0.87x0.55	28x16 / 1.10x0.63
B8 $\varnothing d_7$ max ⁽¹⁾	NA*	60 / 2.36	60 / 2.36	80 / 3.15	100 / 3.94
$\varnothing d_x$ max ⁽²⁾	NA*	71 / 2.80	71 / 2.80	94 / 3.70	116 / 4.57
I_3	NA*	48 / 1.89	70 / 2.76	66 / 2.60	76 / 2.99
I_4	NA*	68 / 2.68	84 / 3.31	94 / 3.70	120 / 4.72
Weight (kg / lb)	NA*	6.6 / 15	7.1 / 16	14 / 31	27 / 58

NOTES:

- All units are in mm / in. unless otherwise stated.
- B7 coupling bush is machined in accordance to the above indications.
- (NA*) for model 010, please refer to type B5/B6.

(1) $\varnothing d_7$ with standard keyway according to ISO 773.

(2) $\varnothing d_x$ = The maximum accepted diameter described by the key.

Thrust Block Type B7/B8

Figure 12. Thrust Block Type B7/B8

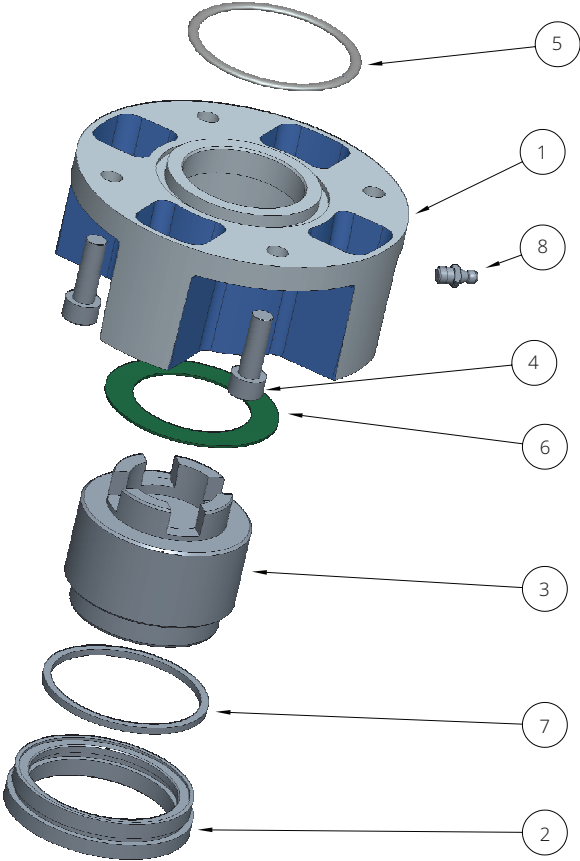


Table 49. Output Drive Type B7/B8 Dimensions

Item	Quantity	Description	Material	Part Number
1	1	Thrust block	Cast iron	3800100400
2	1	Seal locking ring	Carbon steel	3800100410
3	1	Bush	Carbon steel	3800102450
4	4	Screw	Stainless steel	8058212000
5	1	O-ring	NBR	8092141000
6	2	Thrust bearing washer	Alloy steel	8411045000
7	1	Q-ring	NBR	8800914133
8	1	Greaser	Carbon steel	8870120000

Spare Parts List

Figure 13. General Model Overview

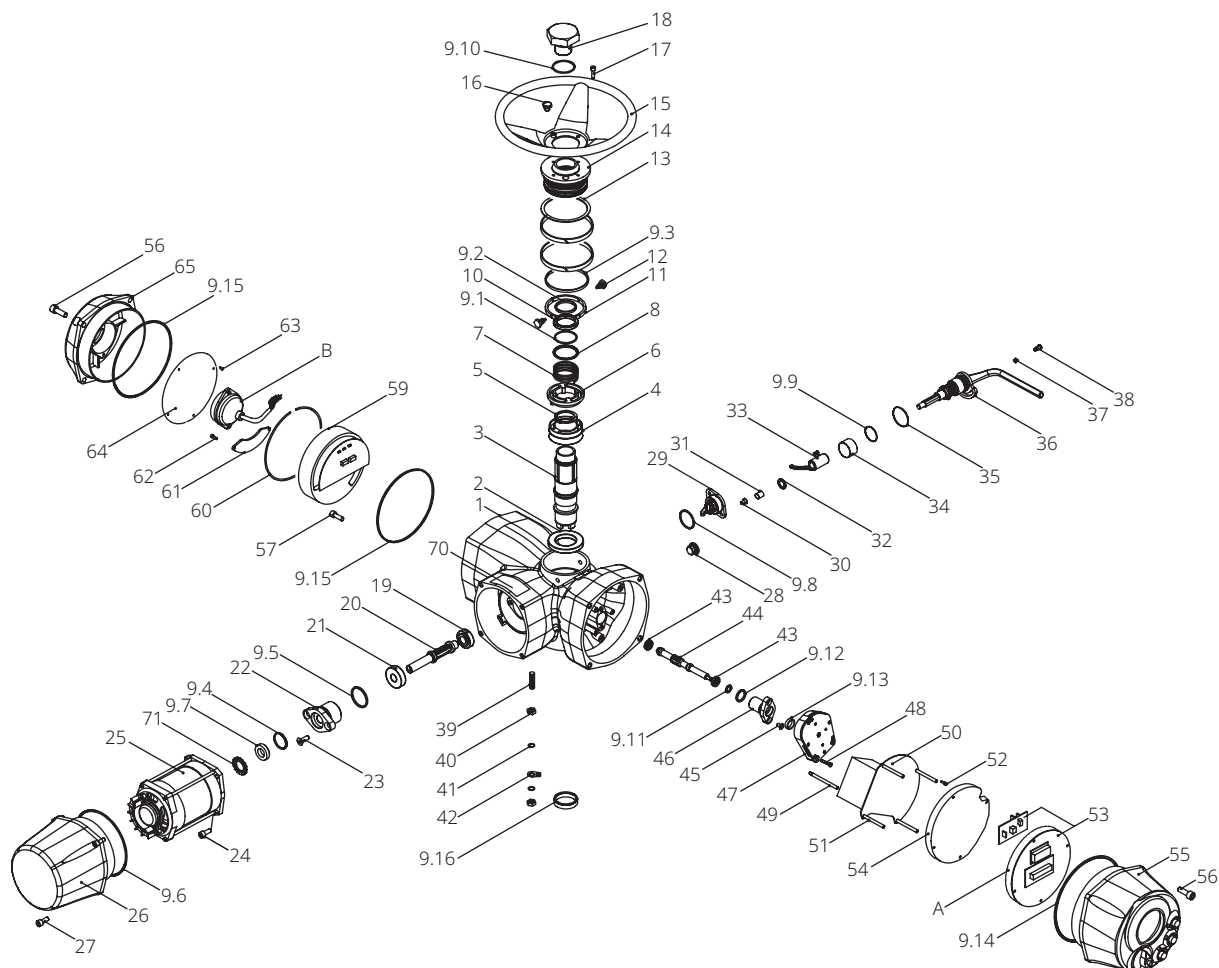


Table 50. ICON3000 Spare Parts List

Item	Quantity	Description	Item	Quantity	Description	Item	Quantity	Description
1	1	Housing	13	1	Cover shoulder washer	41	2	Washer
2	1	Bearing	14	1	Handwheel cover	42	1	Earth plate
3	1	Hollow shaft	15	1	Handwheel	43	2	Bearing
4	1	Worm wheel	16	1	Oil plug	44	1	Position shaft
5	1	Circlip	17	4	Screw	45	4	Screw
6	1	Drive sleeve	18	1	Stem protection tube	46	1	Position shaft flange
7	1	Spring	19	1	Bearing	47	1	Position sensor
8	1	Spring retaining ring	20	1	Worm gear	48	3	Screw
9	1	* Seal Kit	21	1	Bearing	49	4	Column
9.1	1	* O-ring	22	1	Worm gear flange	50	1	Power card
9.2	1	* Seal Ring	23	2	Screw	51	4	Column
9.3	1	* Q-Ring	24	4	Screw	52	4	Screw
9.4	1	* O-ring	25	1	Electric motor	53	1	Control card
9.5	1	* O-ring	26	1	Electric motor cover	54	1	Power card cover
9.6	1	* O-ring	27	4	Screw	55	1	Local interface group
9.7	1	* Seal Ring	28	1	Oil plug	56	8	Screw
9.8	1	* O-ring	29	1	Hand-auto finger	57	1	Screw
9.9	1	* O-ring	30	2	Screw	59	1	Terminal board
9.10	1	* O-ring	31	1	Bush	60	1	Circlip
9.11	1	* Q-Ring	32	1	Fork washer	61	1	Power terminals cover
9.12	1	* O-ring	33	1	Fork	62	2	Screw
9.13	1	* Seal Ring	34	1	Bearing bush	63	4	Screw
9.14	1	* O-ring	35	1	Lever washer	64	1	Terminal board plate
9.15	2	* O-ring	36	1	Lever group	65	1	Terminal board cover
9.16	1	* Seal Ring	37	1	Lever screw block	70	1	Data plate
10	1	Bearing	38	1	Screw	71	1	Circlip
11	2	Cover ring	39	1	Earth bolt	A	1	Process card
12	2	Cover screw block	40	2	Nut	B	1	Battery kit

NOTE:

* Recommended spare parts

Wiring Diagram Code

Data applicable to the multi-turn actuator model ICON3000.

Coding Chart											
	Part Number	W	D	8	5	V	T	B	Y1	Y2	
ICON3000 Multi-Turn Actuator											
Control Type and Motor Duty						V					
Short-time duty (S2-15') (S2-30') Inching duty (S4-25% 60 St/h) (S4-25% 600 St/h) Local CONTROL						A					
Short-time duty (S2-15') (S2-30') Inching duty (S4-25% 60 St/h) (S4-25% 600 St/h) Local CONTROL 4 to 20 mA OUT						B					
Short-time duty (S2-15') (S2-30') Inching duty (S4-25% 60 St/h) (S4-25% 600 St/h) Local CONTROL 4 to 20 mA IN/OUT						C					
Modulating duty (S4-50% 1200 St/h) Local CONTROL						N					
Modulating duty (S4-50% 1200 St/h) Local CONTROL 4 to 20 mA OUT						E					
Modulating duty (S4-50% 1200 St/h) Local CONTROL 4 to 20 mA IN/OUT						M					
Power Supply							T				
Direct Current							C				
Single-Phase							M				
Three-Phase							T				
Control Options								B			
Hard-wired (Basic)								0			
LonWorks								A			
Profibus DP V1								G			
Profibus DP V1 redundant								K			
Profibus DP V2 Redundant								L			
Modbus® redundant								V			
Modbus single channel with repeater								W			
Modbus single channel (RDM ready)								R			
FOUNDATION™ Fieldbus								N			
HART 7								H			
HART 7 - Wireless connectivity								T			
Accessories									Y1	Y2	
Basic									0	0	

Data applicable to the multi-turn actuator model ICON3000V2.

Coding Chart																				
											Part Number	W	D	8	6	V	T	B	Y1	Y2
ICON3000 Multi-Turn Actuator																				
Control Type and Motor Duty																				
Short-time duty (S2-15') (S2-30') Inching duty (S4-25% 60 St/h) (S4-25% 600 St/h) Local CONTROL																				
Short-time duty (S2-15') (S2-30') Inching duty (S4-25% 60 St/h) (S4-25% 600 St/h) Local CONTROL 4 to 20 mA OUT																				
Short-time duty (S2-15') (S2-30') Inching duty (S4-25% 60 St/h) (S4-25% 600 St/h) Local CONTROL 4 to 20 mA IN/OUT																				
Modulating duty (S4-50% 1200 St/h) Local CONTROL																				
Modulating duty (S4-50% 1200 St/h) Local CONTROL 4 to 20 mA OUT																				
Modulating duty (S4-50% 1200 St/h) Local CONTROL 4 to 20 mA IN/OUT																				
Power Supply																				
Direct Current																				
Single-Phase																				
Three-Phase																				
Control Options																				
Hard-wired (Basic)																				
LonWorks																				
Profibus DP V1																				
Profibus DP V1 redundant																				
Profibus DP V2 Redundant																				
Modbus® redundant																				
Modbus single channel with repeater																				
Modbus single channel (RDM ready)																				
FOUNDATION Fieldbus																				
HART 7																				
HART 7 - Wireless connectivity																				
Accessories																				
Basic																				

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