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## FIRST FLOW CONTROL (TIANJIN) CO., LTD.

A SUB-BRAND OF MATERIAL PIONEER INC. · ESTABLISHED 1903

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<b>EFX-D</b>	<b>TYPE</b> MULTI-TURN INTELLIGENT ELECTRIC ACTUATOR	<b>STANDARD</b> BS EN 15714-2 · ISO 5210 · IEC 60034-1	<b>ORIGIN</b> MADE IN CHINA — DESIGNED BY FFC × MPI
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INTELLIGENT MULTI-TURN · SIL 3 · G INDUCTION (MAINS) + M PMSM (VFD) — PER R&D 2026-05-26

### EFX-D Series

For valve automation in oil & gas, chemical, power, water, marine, steel, cement and paper industries. Designed to exceed BS EN 15714-2 with twice the standard service life. **SIL 3** (TÜV / exida) functional safety. Available in 'G' = induction asynchronous motor (mains-driven, all 6 frames) or 'M' = PMSM (Permanent Magnet Synchronous Motor, VFD-driven, D15 / D30 / D40 only) motor drive, with IP66/67/68 enclosure and ATEX Ex d explosion-proof option.



<b>TORQUE</b>	30 – 3000 N·m
<b>MODELS</b>	D15 / D30 / D40 / D60 / D120 / D250
<b>INTERFACE</b>	ISO 5210 · JB 2920
<b>VOLTAGE</b>	220 / 380 VAC
<b>PROTOCOL</b>	4–20 mA · PROFIBUS · MODBUS
<b>SERVICE LIFE</b>	15 000 cycles (A/B ≤700 N·m)
<b>OPERATING TEMP</b>	-25 ~ +80 °C · low-temp -60 °C
<b>FUNCTIONAL SAFETY</b>	SIL 3 (TÜV / exida)

**2× life**

BS EN 15714-2

**IP68**

10 M / 72 H

**Ex d**

ATEX IIC T6

**SIL 3**

TÜV / EXIDA

## 01 Performance & Mechanical

### PERFORMANCE

<b>Torque range</b>	30 – 3 000 N·m
<b>Rotational speed</b>	Adjustable per selection S07
<b>Working system — On-Off</b>	S2-15min · ≤60 starts/h · Load A/B
<b>Working system — Modulating</b>	S4-50% · ≤1200 starts/h · Load C
<b>Manual override</b>	Handwheel per EN 12570 · ratio 1:1 or 1:4
<b>Position indicator</b>	Local LCD + LED · Power-off retention + LED
<b>Functional safety</b>	SIL 3 (TÜV / exida certified · all 6 frames) SIL 3 · TÜV / exida6

### MECHANICAL

<b>Output interface — Global</b>	ISO 5210 (F code)
<b>Output interface — China</b>	JB 2920 (frame size)
<b>Housing material</b>	High-pressure die-cast aluminium alloy
<b>Anti-corrosion</b>	EN ISO 12944-2 · C5-I / C5-M · KS · 140 µm
<b>Cable entry — Multi-turn</b>	3 × M25 + 1 × M40 NPT
<b>External fasteners</b>	Stainless steel (SS304)

**NOTE** Per R&D 2026-05-26 naming convention: motor-drive variants are encoded at SKU position 8 — 'G' = induction asynchronous motor (mains-driven is available on all 6 frames (D15 – D250); 'M' = PMSM (Permanent Magnet Synchronous Motor, inherently VFD-driven) is available only on D15 / D30 / D40 — D60 / D120 / D250 currently have no PMSM variant. SIL 3 (TÜV / exida) applies to all 6 frames. See selection table on page 3.

R&D 2026-05-26SKU8 — —G+GD15 — D250MVFD +D15 / D30 / D40 — —D60 / D120 / D250VDFSIL 3TÜV / exida63



## 02 Electrical & Control

### ELECTRICAL

Applicable voltage	220 VAC – 380 VAC 430–660 VAC · DC 24–96 V
Frequency	50 / 60 Hz ± 5%
Motor	Class F insulation · thermal protector at 135 °C
Drive technology	PMSM (pos-8 = 'M', Permanent Magnet Synchronous Motor, VFD-driven) — D15 / D30 / D40 only · Induction async (pos-8 = 'G', mains-driven — all 6 frames PMSM8 = MD15/D30/D408 = G6
Altitude	≤ 2000 m std · ≤ 4000 m (3-phase 400 VAC -15%)

### CONTROL & COMMUNICATION

Input — On-Off	Passive dry contact / Active 24 VDC
Input — Modulating	4–20 mA · PROFIBUS DP · MODBUS RTU
Feedback — On-Off	Passive relay: open / closed / remote
Feedback — Modulating	Passive relay + 4–20 mA position
Fault alarms	Phase loss · Over-torque · Over-temp · Stall · Reverse · Loss-of-signal
Smart features	Bluetooth · OTA · IoT · APP auto-tuning · Early-warning

## 03 Environment & Enclosure

### ENVIRONMENTAL

Operating temperature	-25 ~ +80 °C (standard) -60 ~ +80 °C
Storage temperature	-60 ~ +80 °C · dry environment
Humidity	≤ 90% (25 °C)
Vibration (ISO 3945)	< 1g RMS · 10–1000 Hz
Shock	5 g peak acceleration
Earthquake resistance	1–50 Hz · 2 g
Noise	< 70 dB(A) @ 1 m

### ENCLOSURE & HAZARDOUS-AREA

Ingress protection — std	IP66 / IP67 per EN 60529
Ingress protection — optional	IP68 · 10 m / 72 h continuous immersion
ATEX — Group IIB	II 2G Ex db IIB T4 Gb / II 2D Ex tb IIIC T130 °C Db IP68 Ta -20 ~ +70 °C-40 ~ +70 °C
ATEX — Group IIC	II 2G Ex db IIC T6 Gb / II 2D Ex tb IIIC T80 °C Db IP68 Ta -20 ~ +40 °C-40 ~ +40 °C

## 04 Service Life (BS EN 15714-2)

Variant	Load Class	Torque Range (N·m)	FFC Rated Life FFC	Design Standard
				BS EN 15714-2 · ISO 5210 · IEC 60034-1 · ISO 22153
EFX-D Multi-Turn	A / B	≤ 700	15 000 cycles	≥ 2× BS EN 15714-2 minimum (double-life)
	A / B	701 – 2 500	10 000 cycles	
	C	≤ 700	1 800 000 starts	
	C	701 – 2 500	1 200 000 starts	



## 05 Frame Selection Table

Frame	Max Torque	Handwheel	Max Force	Speed-up	Motor Drive · Pos-8	SIL	Interface
EFX-D15	150	φ200 / φ320	700	1:4	G mains · M VFD	SIL 3	ISO 5210
EFX-D30	300	φ200 / φ320	800	1:4	G mains · M VFD	SIL 3	ISO 5210
EFX-D40	400	φ200 / φ320	700	1:1	G mains · M VFD	SIL 3	ISO 5210
EFX-D60	600	φ200 / φ320	700	1:1	G mains only	SIL 3	ISO 5210
EFX-D120	1 200	φ200 / φ320	700	1:1	G mains only	SIL 3	ISO 5210
EFX-D250	3 000	φ200 / φ320	700	1:1	G mains only	SIL 3	ISO 5210

**SELECTION NOTES** (1) Handwheel diameter — first value standard, second optional. (2) Max torque shown is the upper rating; actual sizing must consider duty cycle, starting frequency and ambient temp. (3) For non-standard interfaces (NPT cable entry, custom flange) contact FFC engineering.

NPTFFC

## 06 Ordering Code · 9-Segment SKU

### EXAMPLE

### EFX-D30-30-24-I-eIM + EX

EFX	① Series prefix — FFC EFX series (Elite Force · X = Ex-proof)	<b>D30</b>	② Size — D15 / D30 / D40 / D60 / D120 / D250
30	③ Torque — number × 10 N·m (30 = 300 N·m)	<b>24</b>	④ Speed — per-frame subset of {24, 36, 48, 60, 72, 96, 120, 144, 192} r/min (see § 7-1 matrix)
I	⑤ Control type — O = On-Off · I = Modulating	<b>E</b>	⑥ Voltage — e = AC 380V/3-ph · d = AC 220V/1-ph
I	⑦ Control unit — I = Intelligent · S = Bus	<b>M</b>	⑧ Motor drive — M = PMSM (Permanent Magnet Synchronous, VFD-driven · D15/D30/D40 only) · G = Induction async (mains-driven all 6 frames)
+EX	⑨ Extension — EX = Ex-proof · MSL = anti-magnetic · S = split body · H = base-type		

**VFD constraint** (pos 8): 'M' available on D15 / D30 / D40 only; D60 / D120 / D250 ship 'G' (mains only). **SIL 3** (TÜV / exida) applies to all 6 frames. Accessories (Modbus / PROFIBUS / heater / gearbox) ordered separately by accessory code — not part of the 9-segment SKU.

VFD8MD15 / D30 / D40D60 / D120 / D250GSIL 3TÜV / exida6Modbus / PROFIBUS 9SKU

## 07 Standards & Certifications

BS EN 15714-2	ISO 5210	ISO 5211	IEC 60034-1	ISO 22153	EN 60529 (IP)	EN 12570 (Manual)	EN ISO 12944-2	ATEX 2014/34/EU
IECEX	IEC 61508 SIL 3	TÜV / exida	ISO 9001:2015	CE	RoHS / REACH	EAC (CU-TR)		

**DATASHEET DISCLAIMER** Specifications subject to change without notice as products evolve. For the binding offer, refer to the quotation (QUO-) or technical agreement (TA-) under the relevant project number. Drawings, dimensional details, and curves are available on request.

QUO-TA-



## 08 Selection Parameter Matrices

**LEGEND** Off-table options: contact official channels.  Y = available ·  N = unavailable.

### 7-1 · EFX-D Standalone Multi-Turn Selection Range

BS EN 15714-2 duty · Class A / B (factory default 30 %, on-off)

Frame	Torque (N·m)	Output Speed (r/min)									VFD	Supply
		24	36	48	60	72	96	120	144	192		
EFX-D15	30 – 250	Y	Y	Y	–	Y	Y	–	Y	Y	Y	1 / 3 P
EFX-D30	150 – 450	Y	Y	Y	–	Y	Y	–	Y	Y	Y	1 / 3 P
EFX-D40	200 – 800	Y	Y	Y	–	Y	Y	–	Y	Y	Y	1 / 3 P
EFX-D60	350 – 900	–	–	–	Y	–	–	Y	–	–	–	3 P
EFX-D120	550 – 1 200	Y	Y	Y	Y	Y	–	–	Y	Y	–	3 P
EFX-D250	1 000 – 3 000	Y	Y	Y	Y	Y	–	–	Y	Y	–	3 P

BS EN 15714-2 duty · Class C (factory default 50 %, modulating)

Frame	Torque (N·m)	Output Speed (r/min)									VFD	Supply
		24	36	48	60	72	96	120	144	192		
EFX-D15	30 – 150	Y	Y	Y	–	Y	Y	–	Y	Y	Y	1 / 3 P
EFX-D30	150 – 300	Y	Y	Y	–	Y	Y	–	Y	Y	Y	1 / 3 P
EFX-D40	200 – 800	Y	Y	Y	–	Y	Y	–	Y	Y	Y	1 / 3 P
EFX-D60	350 – 900	–	–	–	Y	–	–	Y	–	–	–	3 P
EFX-D120	550 – 1 200	Y	Y	Y	Y	Y	–	–	Y	Y	–	3 P
EFX-D250	1 000 – 3 000	Y	Y	Y	Y	Y	–	–	Y	Y	–	3 P

**CLASS C NOTE** Torque max is reduced for D15 (30–150 N·m) and D30 (150–300 N·m) under Class C modulating duty. All other frames retain the standalone torque range.

### 7-2 · EFX-D Combined-Type Multi-Turn Selection Range

Base actuator + GD bevel gearbox · combined-type torque amplification

Base + Gearbox	On-Off Torque (N·m)	Modulating Torque (N·m)	Speed (r/min)	VFD	Supply
EFX-D15-15-72 + GD-0-D	400	320	18	Y	1 / 3 P
EFX-D30-25-72 + GD-1-D	600	480	18	Y	1 / 3 P
EFX-D30-25-72 + GD-2-D	900	720	18	Y	1 / 3 P
EFX-D30-25-72 + GD-3-D	1 200	960	18	Y	1 / 3 P
EFX-D40-40-72 + GD-35-D	1 800	1 440	18	Y	1 / 3 P
EFX-D60-90-60 + GD-35-D	2 500	2 000	15	–	3 P
EFX-D60-90-60 + GD-4-D	4 000	3 200	10	–	3 P
EFX-D120-120-36 + GD-4-D	6 000	4 800	6	–	3 P
EFX-D250-135-48 + GD-5-D	8 000	6 400	7	–	3 P
EFX-D250-180-36 + GD-6-D	10 000	8 000	5	–	3 P
EFX-D250-300-24 + GD-7-D	<b>18 500</b>	14 800	6.5	–	3 P

**VALVE SIZING RULE (EN 12570)** Actual valve selection: valve torque × 0.7 = actuator rated torque (per EN 12570). Max operating torque ≥ 0.7 × actuator rated torque. FFC can provide larger handwheels on request.