

# Servomotors for explosive atmospheres

EX series

1,75 to 35 Nm



## Description

EX series is a range of permanent magnets servomotors designed for use in explosive atmospheres. Featuring robust explosion-proof housings, EX motors are capable of bearing internal explosions with no risks of propagation to the neighbouring environment. Two versions are available, conforming with north american or european safety standards. EX servomotors are characterized by excellent motion quality, great acceleration / deceleration capabilities, and high torque output over a wide speed range. Various winding variants and numerous options are available to offer maximum flexibility.

## Advantages

**Servomotors with explosion proof housings**

**CE or UL versions available**

**High dynamic performances**

**Compactness and robustness**

**No maintenance**

## Applications

- Printing machinery
- Paint spray equipments
- Plastics machinery
- Chemical, petro-chemical and pharmaceutical industries
- Waste processing plants...



General technical characteristics	
Motor type	Permanent magnets synchronous motors
Number of poles	10
Torque range	1,75 to 35 Nm
Speed range	2000 to 8000 rpm
Mounting	- Flange with smooth holes
Mechanical interface	- Solid smooth shaft (standard) - Solid shaft with key (option)
Feedback sensors	- 2 poles resolver (standard) - Absolute EnDat encoder (option) - Absolute Hiperface encoder (option)
Thermal protection	- Thermostiches and thermofuses integrated to the winding
Other options	- Parking brake

Voltage supply	230 / 400 VAC	230/ 480 VAC
Conformance	- ATEX 94/9/EC Directive - EN60079-0, EN60079-1 - EN61241-0 and EN61241-1 standards	- UL 674 standard : Electric Motors and Generators for use in Division 1 Hazardous (Classified) Locations
Classification	- II 2G Ex d IIB T4 IP64 (Gaz) - II 2GD Ex d IIB T4 IP65 Ex tD A21 IP65 T135°C (Gas and dust)	- Class 1, Division 1, Group C & D
Ingress protection level	- IP64 (standard) - IP65 (option)	- IP65
Connections	- cable glands	- Tapped holes
Marking		

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## Selection and ordering

Rated Speed $N_{MAX}$ (rpm)	Stall Torque $M_0$ (Nm)	Stall Current $I_0$ (A <sub>RMS</sub> )	Rated Torque $M_N$ (Nm)	Rated Current $I_N$ (A <sub>RMS</sub> )	Peak Torque $M_{MAX}$ (Nm)	Peak Current $I_{MAX}$ (A <sub>RMS</sub> )	Max. Speed with Compax3 $N_{MAX}$ (rpm)	Moment of Inertia $J$ (kgm <sup>2</sup> x10 <sup>-5</sup> )	Reference					
230 VAC power supply														
2300	1.75	1.24	1.66	1.19	6.6	5.64	1960	7.9	E X 3 1 0 E	▪	PR 1	▪	▪	▪
4000	1.75	2.16	1.54	1.96	6.6	9.85	3630	7.9	E X 3 1 0 E	▪	KR 1	▪	▪	▪
2300	3.5	2.46	3.18	2.26	13.4	11.3	2030	29	E X 4 2 0 E	▪	PR 1	▪	▪	▪
4000	3.5	4.26	2.67	3.33	13.4	19.6	3700	29	E X 4 2 0 E	▪	JR 1	▪	▪	▪
3200	4.8	4.57	3.74	3.63	18.8	21	2930	42.6	E X 4 3 0 E	▪	JR 1	▪	▪	▪
4000	4.8	5.8	3.26	4.05	18.8	26.6	3790	42.6	E X 4 3 0 E	▪	FR 1	▪	▪	▪
2500	7	5.51	5.49	4.47	26.7	24.8	2310	98	E X 6 2 0 E	▪	OR 1	▪	▪	▪
3000	10.4	10	7.24	7.32	40	42.2	2860	147	E X 6 3 0 E	▪	IR 1	▪	▪	▪
2200	14	9.28	11.16	7.45	50	41.8	2050	320	E X 8 2 0 E	▪	RR 1	▪	▪	▪
3600	14	14.85	7.53	8.3	50	66.9	3430	320	E X 8 2 0 E	▪	LR 1	▪	▪	▪
2200	24.5	16.04	14.18	9.54	92	72.7	2120	620	E X 8 4 0 E	▪	JR 1	▪	▪	▪
2500	35	27.3	8.5	7.28	137	133	2500	920	E X 8 6 0 E	▪	DR 1	▪	▪	▪
400VAC power supply														
4000	1.75	1.24	1.54	1.12	6.6	5.64	3600	7.9	E X 3 1 0 E	▪	PR 1	▪	▪	▪
2000	3.5	1.24	3.22	1.15	13.4	5.68	1740	29	E X 4 2 0 E	▪	VR 1	▪	▪	▪
4000	3.5	2.46	2.68	1.93	13.4	11.3	3720	29	E X 4 2 0 E	▪	PR 1	▪	▪	▪
3000	4.8	2.46	3.85	2	18.8	11.3	2740	42.6	E X 4 3 0 E	▪	PR 1	▪	▪	▪
4000	4.8	3.3	3.26	2.31	18.8	15.1	3740	42.6	E X 4 3 0 E	▪	LR 1	▪	▪	▪
4300	7	5.22	3.13	2.75	26.7	24.8	4240	98	E X 6 2 0 E	▪	OR 1	▪	▪	▪
2900	10.4	5.54	7.42	4.12	40	23.2	2750	147	E X 6 3 0 E	▪	YR 1	▪	▪	▪
4000	10.4	7.5	5.2	4.08	40	31.4	3820	147	E X 6 3 0 E	▪	NR 1	▪	▪	▪
2200	14	5.4	11.16	4.36	50	24.3	2080	320	E X 8 2 0 E	▪	WR 1	▪	▪	▪
3600	14	9.3	7.53	5.19	50	41.8	3600	320	E X 8 2 0 E	▪	RR 1	▪	▪	▪
2100	24.5	8.55	15	5.37	92	38.8	1950	620	E X 8 4 0 E	▪	QR 1	▪	▪	▪
3300	24.5	14.3	2.85	2.07	92	64.7	3300	620	E X 8 4 0 E	▪	KR 1	▪	▪	▪
2500	35	15.4	8.5	4.1	137	75	2500	920	E X 8 6 0 E	▪	JR 1	▪	▪	▪

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## Drives associations

Motor	Rated Speed $N_{MAX}$ (rpm)	Associated drives sizes				
		Compax3	Max. Speed with Compax3 $N_{MAX}$ (rpm)	890SD	650S	DIGIVEX
<b>230 VAC power supply</b>						
EX310E■PR1■■■	2300	C3S025V2...	1960	890SD-231300B0...	650S-21140010...	DSD13004...
EX310E■KR1■■■	4000	C3S025V2...	3630	890SD-231300B0...	650S-21140010..	DSD13004...
EX420E■PR1■■■	2300	C3S025V2...	2030	890SD-231550B0...	650S-21140010...	DSD13004...
EX420E■JR1■■■	4000	C3S063V2...	3700	890SD-231700B0...	650S-21170020...	DSD13007...
EX430E■JR1■■■	3200	C3S063V2...	2930	890SD-231700B0...	650S-21170020...	DSD13007...
EX430E■FR1■■■	4000	C3S063V2...	3790	890SD-231700B0...	650S-21170020...	DSD13015...
EX620E■OR1■■■	2500	C3S063V2...	2310	890SD-231700B0...	650S-21170020...	DSD13015...
EX630E■IR1■■■	3000	C3S100V2...	2860	890SD-232165B0...	-	DSD13015...
EX820E■RR1■■■	2200	C3S100V2...	2050	890SD-232165B0...	-	DSD13015...
EX820E■LR1■■■	3600	C3S150V2...	3430	890SD-232240C0...	-	DSD13030...
EX840E■JR1■■■	2200	-	2120	890SD-232240C0...	-	DSD13030...
EX860E■DR1■■■	2500	-	2500	890SD-232300C0...	-	DSD13060...
<b>480 VAC power supply</b>						
EX310E■PR1■■■	4000	C3S015V4...	3600	890SD-531200B0...	650S-43125020...	DSD16002...
EX420E■VR1■■■	2000	C3S015V4...	1740	890SD-531200B0...	650S-43125020...	DSD16002...
EX420E■PR1■■■	4000	C3S038V4...	3720	890SD-531350B0...	650S-43125020...	DSD16004...
EX430E■PR1■■■	3000	C3S038V4...	2740	890SD-531350B0...	650S-43125020...	DSD16004...
EX430E■LR1■■■	4000	C3S038V4...	3740	890SD-531450B0...	650S-43155020...	DSD16008...
EX620E■OR1■■■	4300	C3S075V4...	4240	890SD-532100B0...	650S-43155020...	DSD16008...
EX630E■YR1■■■	2900	C3S075V4...	2750	890SD-532100B0...	650S-43155020...	DSD16008...
EX630E■NR1■■■	4000	C3S075V4...	3820	890SD-532120B0...	650S-43190030...	DSD16016...
EX820E■WR1■■■	2200	C3S075V4...	2080	890SD-532100B0...	650S-43155020...	DSD16008...
EX820E■RR1■■■	3600	C3S150V4...	3600	890SD-532160B0...	650S-43216030...	DSD16016...
EX840E■QR1■■■	2100	C3S150V4...	1950	890SD-532120B0...	650S-43190030...	DSD16016...
EX840E■KR1■■■	3300	C3S150V4...	3300	890SD-53216SB0...	650S-43216030...	DSD16032...
EX860E■JR1■■■	2500	C3S300V4...	2500	890SD-53216SB0...	650S-43216030...	DSD16032...

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## EX codification

EX motors - CE marked	Product code example			
	E X 8 6 0 E	J R 1		
<b>FEEDBACK SENSOR</b>				
<b>2 poles resolver (Standard)</b>				
Absolute multi-turn HIPERFACE 16ppr SEL37			A	
Absolute singleturn HIPERFACE SKS36 Encoder (128 periods/rev)			Q	
Absolute multiturn HIPERFACE SKM36 Encoder (128 periods/rev)			R	
Absolute singleturn HIPERFACE SRS50 encoder 1024 ppr (not available for EX3)			S	
Absolute multiturn HIPERFACE SRM50 encoder 1024 ppr (not available for EX3)			T	
Absolute dingleturn ENDAT ECN 1113 encoder			U	
Absolute multiturn ENDAT EQN 1125 encoder			V	
Low cost encoder with 10 commutation tracks 2048 ppr			W	
Without feedback sensor			X	
Other sensor			Y	
			Z	
<b>BRAKE</b>				
<b>Motor without brake (standard) + thermal switch sensor</b>				2
Motor with brake + thermal switch sensor				5
<b>INGRESS PROTECTION LEVEL</b>				
<b>IP64</b>				0
IP65				1
<b>SHAFT END</b>				
<b>Smooth shaft</b>				0
Keyed shaft				1

# CE servomotors

EX series

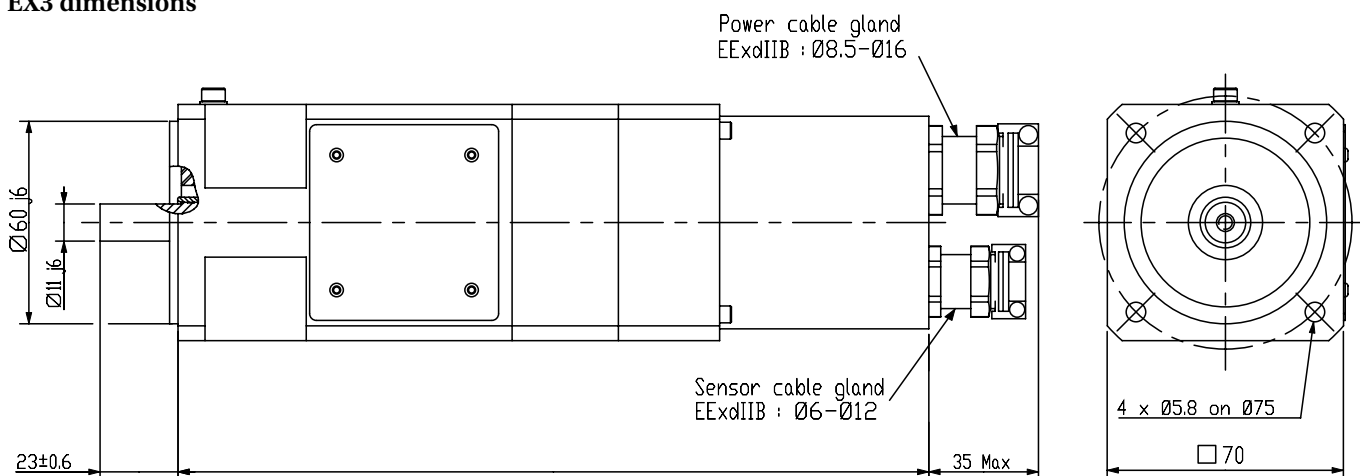
1,75 to 35 Nm

Dimensions (resolver version)



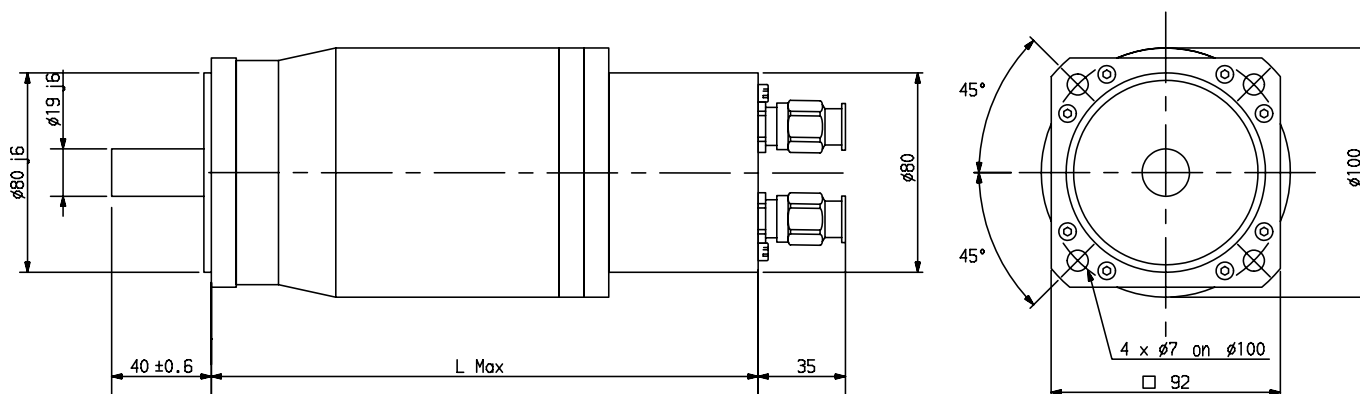
EX3 dimensions (mm)		
Motor	L	
	Without brake	With brake
E X 3 1 0	225	255

## EX3 dimensions



EX4 dimensions (mm)		
Motor	L	
	Without brake	With brake
E X 4 2 0	265	290
E X 4 3 0	290	315

## EX4 dimensions



# 1 CE servomotors

EX series

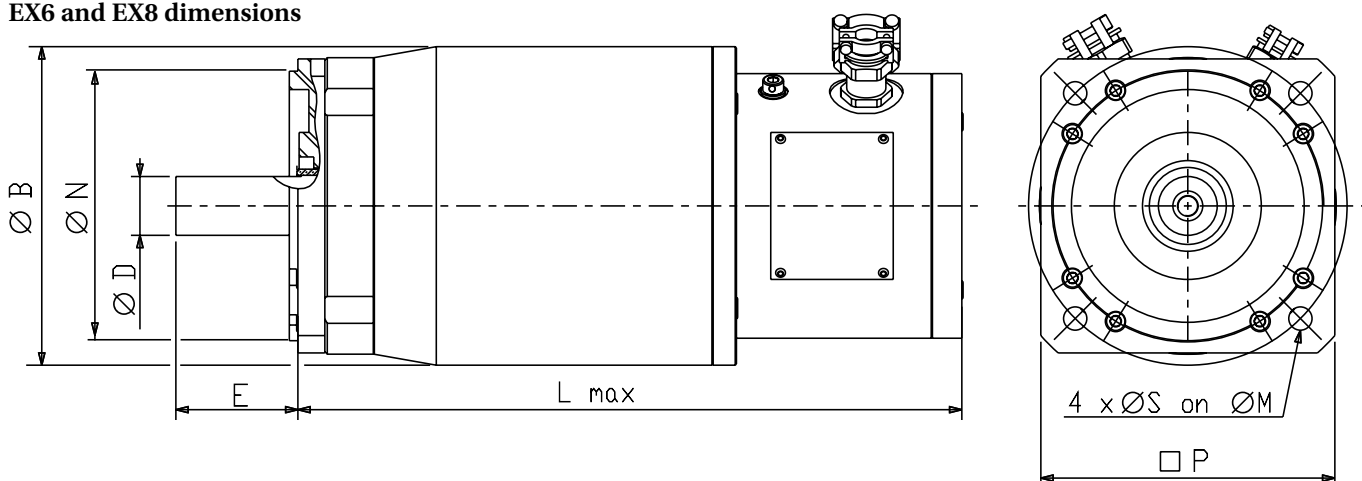
1,75 to 35 Nm

Dimensions (resolver version)



EX6-EX8 dimensions (mm)									
Motor	N	D	E	B	P	S	M	L	
								Without brake	With brake
EX620	110	24	50	130	120	8.4	130	275	290
EX630	110	24	50	130	120	8.4	130	300	325
EX820	130	32	58	165	155	12	165	290	325
EX840	130	32	58	165	155	12	165	350	385
EX860	130	32	58	165	155	12	165	410	445

EX6 and EX8 dimensions



# UL servomotors

EX series

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## Selection and ordering

Rated Speed $N_{MAX}$ (rpm)	Stall Torque $M_0$ (Nm)	Stall Current $I_0$ (A <sub>RMS</sub> )	Rated Torque $M_N$ (Nm)	Rated Current $I_N$ (A <sub>RMS</sub> )	Peak Torque $M_{MAX}$ (Nm)	Peak Current $I_{MAX}$ (A <sub>RMS</sub> )	Moment of Inertia $J$ kgm <sup>2</sup> x10 <sup>-5</sup>	Product Code										
230 VAC power supply																		
4200	1.6	2.46	1.41	2.24	3.98	6.29	7.9	E	X	3	1	0	U	■	UR1	■	1	■
4000	3.2	4.15	2.45	3.25	8	10.8	29	E	X	4	2	0	U	■	IR1	■	1	■
3200	4.4	4.88	3.48	3.94	11	12.6	42.6	E	X	4	3	0	U	■	GR1	■	1	■
2750	6.4	6.02	4.76	4.67	17.4	16.2	98	E	X	6	2	0	U	■	MR1	■	1	■
2700	9.5	7.91	7.12	6.16	23.8	19.4	147	E	X	6	3	0	U	■	KR1	■	1	■
2300	12.9	9.1	10.1	7.21	30	22.8	320	E	X	8	2	0	U	■	QR1	■	1	■
1650	22.6	12	16.8	9	60	34.6	620	E	X	8	4	0	U	■	LR1	■	1	■
1500	31.4	13.9	22.3	10.01	90	43.5	920	E	X	8	6	0	U	■	JR1	■	1	■
480 VAC power supply																		
7600	1.6	2.46	1.03	1.74	3.98	6.29	7.9	E	X	3	1	0	U	■	UR1	■	1	■
7000	3.2	4.15	1.1	1.58	8	10.8	29	E	X	4	2	0	U	■	IR1	■	1	■
5700	4.4	4.88	1.72	2.07	11	12.6	42.6	E	X	4	3	0	U	■	GR1	■	1	■
5000	6.4	6.02	1.71	1.95	17.4	16.2	98	E	X	6	2	0	U	■	MR1	■	1	■
4200	9.5	7.91	4.38	4.02	23.8	19.4	147	E	X	6	3	0	U	■	KR1	■	1	■
4000	12.9	9.1	5.77	4.27	30	22.8	320	E	X	8	2	0	U	■	QR1	■	1	■
3000	22.6	12	5.84	3.39	60	34.6	620	E	X	8	4	0	U	■	LR1	■	1	■
2500	31.4	13.9	8.31	4.01	90	43.5	920	E	X	8	6	0	U	■	JR1	■	1	■

## Associated drives

Motor	Rated Speed $N_{MAX}$ (rpm)	Associated Drives Sizes			
		Compax3	890SD	650S	DIGIVEX
230 VAC power supply					
E X 3 1 0 U ■ U R 1 ■ 1 ■	4200	C3S063V2...	890SD-231550B0...	650S-21140010...	DSD13004...
E X 4 2 0 U ■ I R 1 ■ 1 ■	4000	C3S063V2...	890SD-231700B0...	650S-21170020...	DSD13007...
E X 4 3 0 U ■ G R 1 ■ 1 ■	3200	C3S063V2...	890SD-231700B0...	650S-21170020...	DSD13015...
E X 6 2 0 U ■ M R 1 ■ 1 ■	2750	C3S063V2...	890SD-231700B0...	650S-21170020...	DSD13015...
E X 6 3 0 U ■ K R 1 ■ 1 ■	2700	C3S100V2...	890SD-232165B0...	-	DSD13015...
E X 8 2 0 U ■ Q R 1 ■ 1 ■	2300	C3S100V2...	890SD-232165B0...	-	DSD13015...
E X 8 4 0 U ■ L R 1 ■ 1 ■	1650	C3S150V2...	890SD-232165B0...	-	DSD13030...
E X 8 6 0 U ■ J R 1 ■ 1 ■	1500	C3S150V2...	890SD-232240C0...	-	-
480 VAC power supply					
E X 3 1 0 U ■ U R 1 ■ 1 ■	7600	C3S038V4...	890SD-531450B0...	650S-43125020...	DSD16004...
E X 4 2 0 U ■ I R 1 ■ 1 ■	7000	C3S075V4...	890SD-532100B0...	650S-43155020...	DSD16008...
E X 4 3 0 U ■ G R 1 ■ 1 ■	5700	C3S075V4...	890SD-532100B0...	650S-43155020...	DSD16008...
E X 6 2 0 U ■ M R 1 ■ 1 ■	5000	C3S075V4...	890SD-532100B0...	650S-43190030...	DSD16016...
E X 6 3 0 U ■ K R 1 ■ 1 ■	4200	C3S150V4...	890SD-532120B0...	650S-43190030...	DSD16016...
E X 8 2 0 U ■ Q R 1 ■ 1 ■	4000	C3S150V4...	890SD-532160B0...	650S-43216030...	DSD16016...
E X 8 4 0 U ■ L R 1 ■ 1 ■	3000	C3S150V4...	890SD-53216SB0...	650S-43216030...	DSD16032...
E X 8 6 0 U ■ J R 1 ■ 1 ■	2500	C3S150V4...	890SD-53216SB0...	650S-43216030...	DSD16032...

# UL servomotors

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1,75 to 35 Nm



## EX codification

EX motors - UL marked	Product code example			
	E	X	8 6 0 U	J R 1 1
<b>FEEDBACK SENSOR</b>				
<b>2 poles resolver (Standard)</b>				A
Absolute singleturn HIPERFACE SKS36 Encoder (128 periods/rev)				R
Absolute multiturn HIPERFACE SKM36 Encoder (128 periods/rev)				S
Absolute singleturn HIPERFACE SRS50 encoder 1024 ppr (not available for EX3)				T
Absolute multiturn HIPERFACE SRM50 encoder 1024 ppr (not available for EX3)				U
Absolute singleturn ENDAT ECN 1113 encoder				V
Absolute multiturn ENDAT EQN 1125 encoder				W
Low cost encoder with 10 commutation tracks 2048 ppr				X
Without feedback sensor				Y
Other sensor				Z
<b>BRAKE</b>				
<b>Motor without brake + thermal switch sensor (standard)</b>				2
Motor with Brake + thermal switch sensor				5
<b>INGRESS PROTECTION LEVEL</b>				
<b>IP64</b>				0
IP65				1
<b>SHAFT END</b>				
<b>Smooth shaft</b>				0
Keyed shaft				1



# UL servomotors

EX series

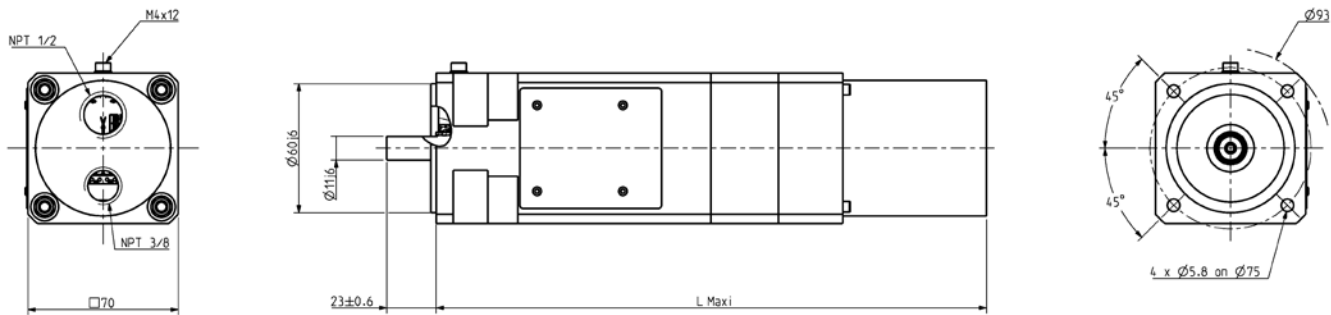
1,75 to 35 Nm



## Dimensions (resolver version)

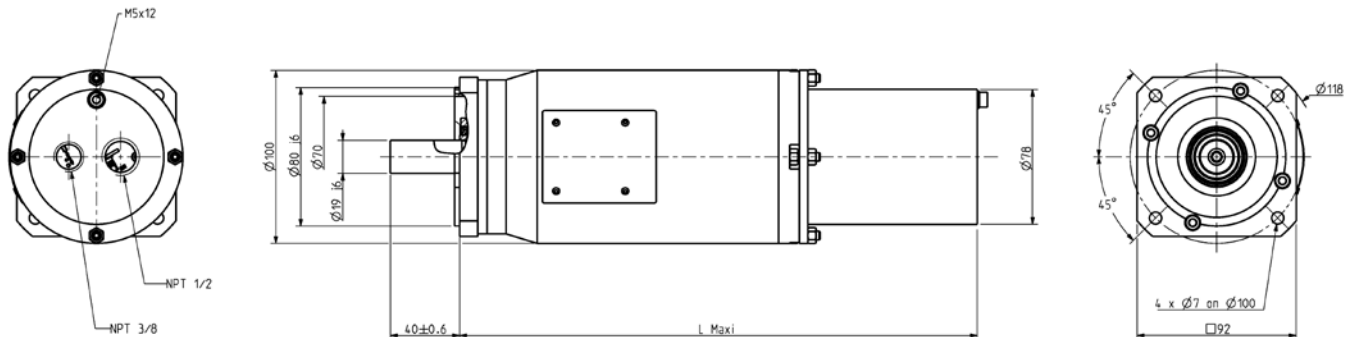
EX3 dimensions UL (mm)		
Motor	L Maxi	
	Without brake	With brake
E X 3 1 0	230	260

### UL EX3 dimensions



EX4 dimensions UL (mm)		
Motor	L Maxi	
	Without brake	With brake
E X 4 2 0	260	305
E X 4 3 0	305	330

### UL EX4 dimensions



# UL servomotors

EX series

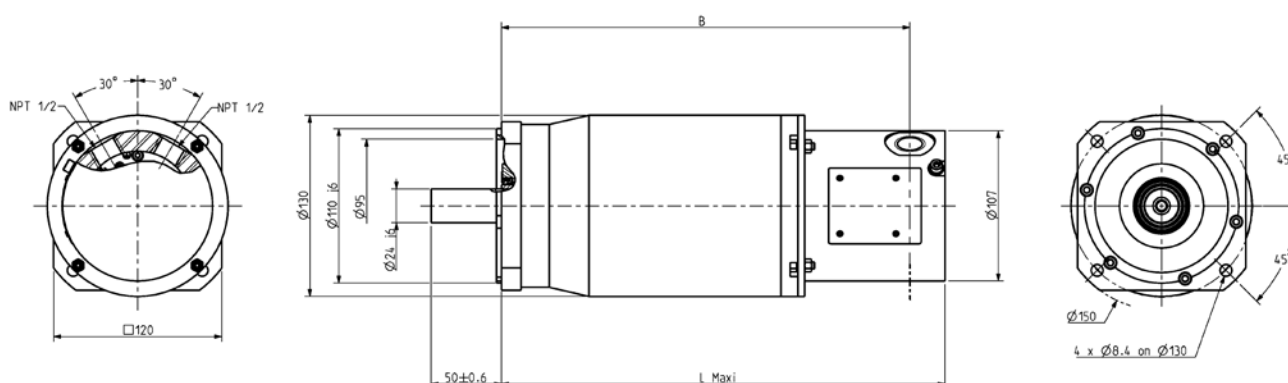
1,75 to 35 Nm



## Dimensions (resolver version)

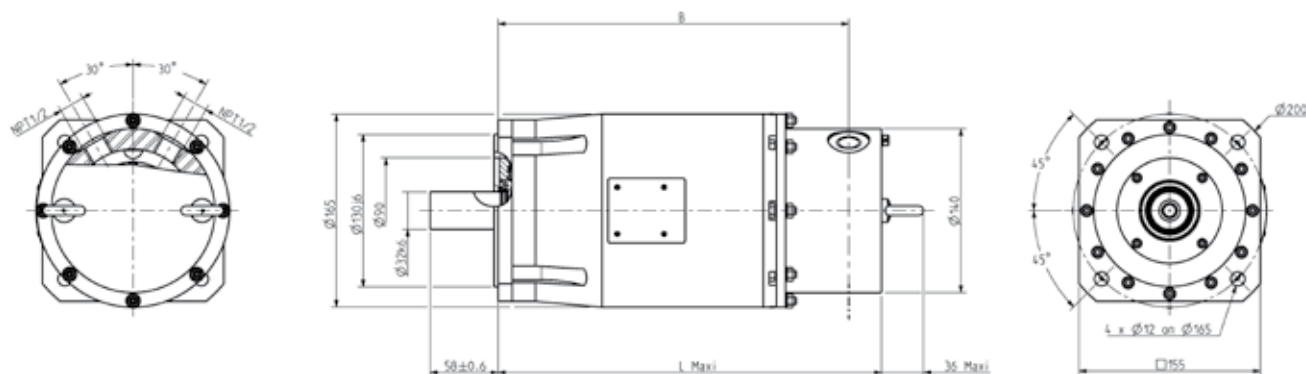
EX6 dimensions UL (mm)				
Motor	L Maxi		B	
	Without brake	With brake	Without brake	With brake
E X 6 2 0	290	320	262.5	291.5
E X 6 3 0	320	435	291.5	316.5

## UL EX6 dimensions



EX8 dimensions UL (mm)				
Motor	L Maxi		B	
	Without brake	With brake	Without brake	With brake
E X 8 2 0	295	330	265	300
E X 8 4 0	355	390	325	360
E X 8 6 0	415	450	385	420

## UL EX8 dimensions



# Cables and accessories

EX series - brushless motors for explosive atmospheres



## Modules and accessories

### Cables for EX ↔ DIGIVEX

Feedback cable	Description
CD1UA1D1R0005 (*)	Resolver or Posivex cable with connectors, length = 5m

Power cable	Description
CD1UQ1D1R0005 (*)	Cable with connectors standard for Digivex $\leq 16\text{Å}$ , length = 5m
CD1UQ2D1R0005 (*)	Cable with connectors for Digivex $\leq 32\text{Å}$ , length = 5m
6537P0051	Cable per meter (4 x 6 mm <sup>2</sup> + 4 x 1,5 mm <sup>2</sup> ) for Digivex 50Å

### Cables for EX ↔ 890

Feedback cable	Description
CS4UA1D1R0005 (*)	Resolver cable with connectors, length = 5m
CS4UV1D1R0005 (*)	Endat encoder cable with connectors - 12pts, length = 5m

Power cable	Description
CS4UQ1D1R0005 (*)	Cable with connectors standard for 890 $\leq 12$ Arms, length = 5m
CS4UQ2D1R0005 (*)	Cable with connectors for 890 $\leq 30$ Arms, length = 5m
6537P0051	Cable per meter (4 x 6 mm <sup>2</sup> + 4 x 1,5 mm <sup>2</sup> ) for 890 < 42 Arms

### Cables for EX ↔ COMPAX 3

Feedback cable	Description
CC3UA1D1R0005 (*)	Resolver cable with connectors, length = 5m
CC3UV1D1R0005 (*)	Endat encoder cable with connectors - 12pts, length = 5m
CC3UR1D1R0005 (*)	Hiperface encoder cable with connectors - length = 5m

Power cable	Description
CC3UQ1D1R0005 (*)	Cable with connectors standard for COMPAX3 $\leq 10$ Arms, length = 5m
CC3UQ2D1R0005 (*)	Cable with connectors for COMPAX3 $\leq 15$ Arms, length = 5m
6537P0051	Cable per meter (4 x 6 mm <sup>2</sup> + 4 x 1,5 mm <sup>2</sup> ) for COMPAX 3 $\leq 30$ Arms

\*) the 3 last digits indicate cable length in meters  $\pm 5\%$ max

For non-standard length cable with length different from : 1 / 2 / 3 / 4 / 5 / 10 / 15 / 20 / 25 / 30 / 40 / 50m please contact us.

Example CD1UP1F1R0015 : power cable, length = 15 m.

# Cables and accessories

EX series - brushless motors for explosive atmospheres



## Modules and accessories

### Cables for EX ↔ 631

Feedback cable	Description
CS1UA1D1R0005 (*)	Resolver cable with connectors, length = 5m

Power cable	Description
CS1UQ1D1R0005 (*)	Cable with connectors standard for 631 ≤ 12 Arms, length = 5m

### Cables for EX ↔ 637 / 638

Feedback cable	Description
CS1UA1D1R0005 (*)	Resolver cable with connectors, length = 5m
CS2UR1D1R0005 (*)	Hiperface encoder cable with connectors - length = 5m

Power cable	Description
CS2UQ1D1R0005 (*)	Cable with connectors standard for 637 / 638 Stand Alone ≤ 12 Arms, length = 5m
CS2UQ2D1R0005 (*)	Cable with connectors for 637 / 638 Stand Alone ≤ 20 Arms, length = 5m
CS3UQ1D1R0005 (*)	Cable with connectors standard for 637 Rack ≤ 12 Arms, length = 5m
CS3UQ2D1R0005 (*)	Cable with connectors for 637 Rack ≤ 20 Arms, length = 5m
6537P0051	Cable per meter (4 x 6 mm <sup>2</sup> + 4 x 1,5 mm <sup>2</sup> ) for 637 ≤ 30 Arms

\*) the 3 last digits indicate cable length in meters ± 5%max

For non-standard length cable with length different from : 1 / 2 / 3 / 4 / 5 / 10 / 15 / 20 / 25 / 30 / 40 / 50m please contact us.

Example CD1UP1F1R0015 : power cable, length = 15 m.