

ELECTRIC AXIS SERIES ELEKTRO SHAK GANTRY

The gantry consists of two parallel belt-driven axes, of which one acts as drive axis (drive X-axis) and the other as driven axis (geared X-axis). Both axes are connected one to the other by means of an anodized aluminium shaft and two flexible couplings that compensate for any minor misalignments between the axes caused by the support base. The shape of both coupling and drive shaft is designed to facilitate disassembly.

The carriages of the drive axis and the driven axis (both with a V-Lock interface featuring a typical shape and grooves) move synchronously thanks to the drive shaft. On the extruded body of both axes, on the side opposite to the carriages, the typical (no grooves) V-Lock dovetail is provided for easy fixing to the support to the support structure using QS elements. On the carriages of the X-axes another SHAK electric axis (Y-axis) is mounted transversally.

The motion is the same as for the single axis and has the same advantages: rigid structure, movement of the carriage with adjustable clearance, the presence of guide lubrication nozzles, the possibility of adjusting belt tensioning.

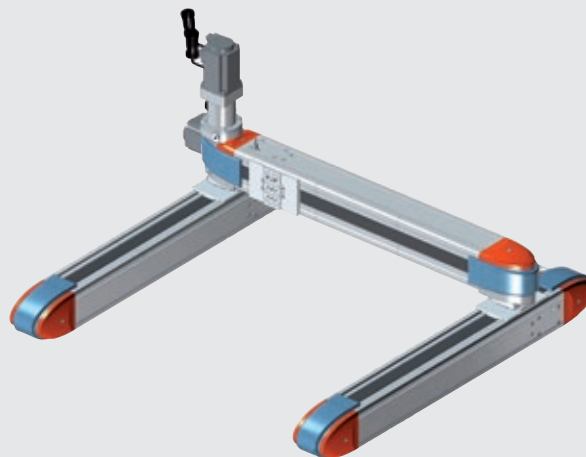
A BRUSHLESS motor with a 1:5 speed gearbox has been adopted as it ensures optimal load capacity without sacrificing the dynamic and speed performance typical of this product.

In addition to the standard drives proposed in the catalogue, the cylinder can be customised with the installation of other motors.

The homing position is identified by an inductive proximity sensor included in the supply.

Two sizes are available, SHAK-GANTRY 340 and SHAK-GANTRY 470, with standard pre-set strokes. For each size, it is also possible to choose on which side to mount the motors (right- or left-hand).

The Elektro SHAK-GANTRY was designed and optimized for horizontal installation. On request, the motors can be supplied with a holding brake, which activates only in the event of a power failure but not when there is a motor overload. For correct operation of the brake, it is important to comply with the limits required by the axial load curves according to speed. Among the accessories available there is a cable-guiding system with a handy cable channel and bracket (in the version with motors on the left-hand side).



TECHNICAL DATA		SHAK GANTRY 340		SHAK GANTRY 470	
Ambient temperature	°C	from -10 to +50			
Maximum relative humidity		90% (no condensate)			
Maximum value of duty cycle		100%			
Maximum X-axis empty speed	m/s	1.8		2.1	
Maximum Y-axis empty speed	m/s	2.4		2.7	
Maximum X-axis empty acceleration	m/s ²	35		25	
Maximum Y-axis empty acceleration	m/s ²	50		50	
Maximum admissible mass	kg	15		25	
MECHANICAL CHARACTERISTICS		SHAK GANTRY 340		SHAK GANTRY 470	
Maximum axial force	N	800		1000	
Maximum force applicable on the pulley	Nm	15		25	
Standard strokes (special execution on request) (see dimensional drawings for standard combinations)	mm	X-axis	Y-axis	X-axis	Y-axis
	mm	400	400	800	600
	mm	600	600	1200	1000
	mm	800	800	1600	1400
	mm	1000	1000	2000	1800
	mm	1200	1200	2400	2200
Repetition accuracy	mm	±0.05			
Noise level	dBA	<66			
Mounting position		Horizontal			
Planarity required for the support surface	mm/m	0.1			
Protection level		IP30			
Toothed belt pitch	mm	5			
Type of belt		PowerGrip® LL GT 5MR 25 FV		PowerGrip® LL GT 5MR 30 ST	
Belt elongation at maximum load		0.15%		0.25%	
Pulley pitch diameter	mm	35.01		44.56	
Stroke / Revolution	mm/rev	110		140	
Homing position sensor		Inductive sensor switch			

MASS AND MOMENT OF INERTIA SHAK GANTRY 340			X-AXIS					Y-AXIS				
Strokes	mm		400	600	800	1000	1200	400	600	800	1000	1200
Weight (without motor and gearbox)	kg		16.2	19	21.9	24.6	27.5	7.7	9	10.4	11.7	13
Motor weight	kg		1.3					1.3				
Gearbox weight	kg		0.8					0.8				
Moving mass (without motor and gearbox)	kg		10.3	11.6	13.1	14.5	15.9	1.28	1.32	1.36	1.40	1.44
J_x Reduced inertia at motor	kg mm ²		476	523	573	620	667	-				
J_y Reduced inertia at motor	kg mm ²		-					99	101	102	103	104
J_j Inertia connection joint	kg mm ²		-					238	306	374	442	510

MASS AND MOMENT OF INERTIA SHAK GANTRY 470			X-AXIS					Y-AXIS				
Strokes	mm		800	1200	1600	2000	2400	600	1000	1400	1800	2200
Weight (without motor and gearbox)	kg		32.7	40.9	48.8	56.9	64.6	15.9	19.8	23.6	27.5	31.2
Motor weight	kg		2.6					2.6				
Gearbox weight	kg		4					4				
Moving mass (without motor and gearbox)	kg		20.3	24.4	28.4	32.5	36.4	2.18	2.28	2.38	2.48	2.58
J_x Reduced inertia at motor	kg mm ²		1759	1986	2207	2434	2650	-				
J_y Reduced inertia at motor	kg mm ²		-					399	404	410	416	422
J_j Inertia connection joint	kg mm ²		-					315	451	587	723	859

Size	d_p [mm]	τ	J_R [kg mm ²]	J_M [kg mm ²]
SHAK GANTRY 340	35.01	1:5	6	41.2
SHAK GANTRY 470	44.56	1:5	37	182

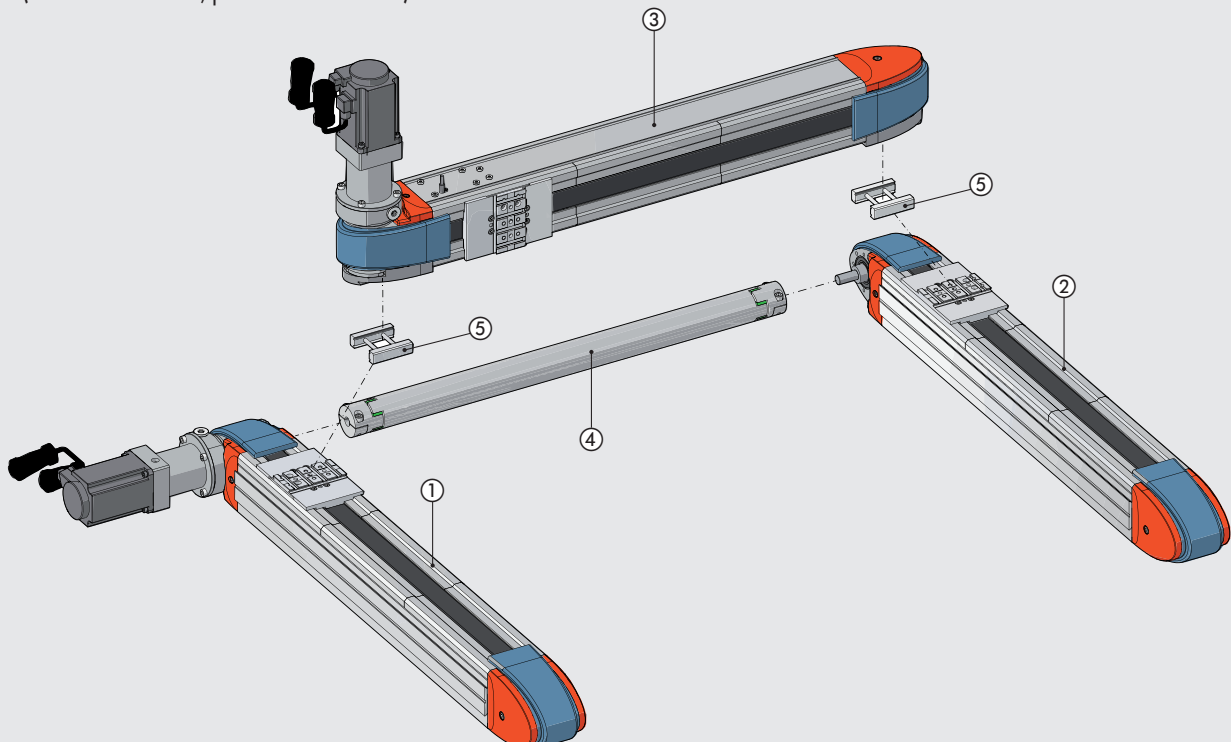
$$J_{tot} = [2 \cdot J_x + J_j + M \cdot (\frac{d_p}{2})^2] \cdot \tau^2 + J_R + J_M$$

N.B.: M = weight axis Y + mass applied on Y axis

CONNECTION JOINT		SHAK GANTRY 340 Y-AXIS	SHAK GANTRY 470 Y-AXIS
Max. number of revs	rpm	2000 (all strokes)	2000 (stroke 600/1000/1400) 1400 (stroke 1800) 1000 (stroke 2200)
Maximum transmissible torque	Nm	25 (hole Ø12)	32 (hole Ø15)

COMPONENTS

- ① Drive X-axis (for bill of materials, please refer to SHAK)
- ② Driven X-axis (for bill of materials, please refer to SHAK)
- ③ Y-axis (for bill of materials, please refer to SHAK)
- ④ Connection joint (aluminium and polyurethane)
- ⑤ QS fixing elements



VERSIONS

VERSION WITH MOTORS ON THE LEFT-HAND SIDE

VERSION WITH MOTORS ON THE RIGHT-HAND SIDE

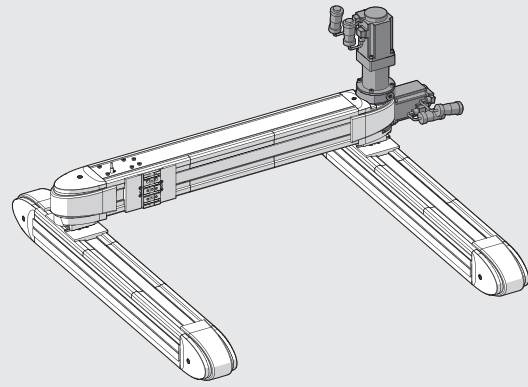
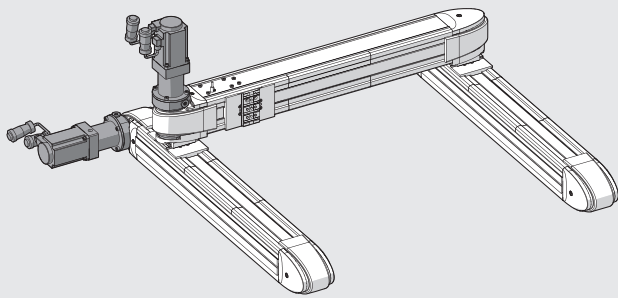
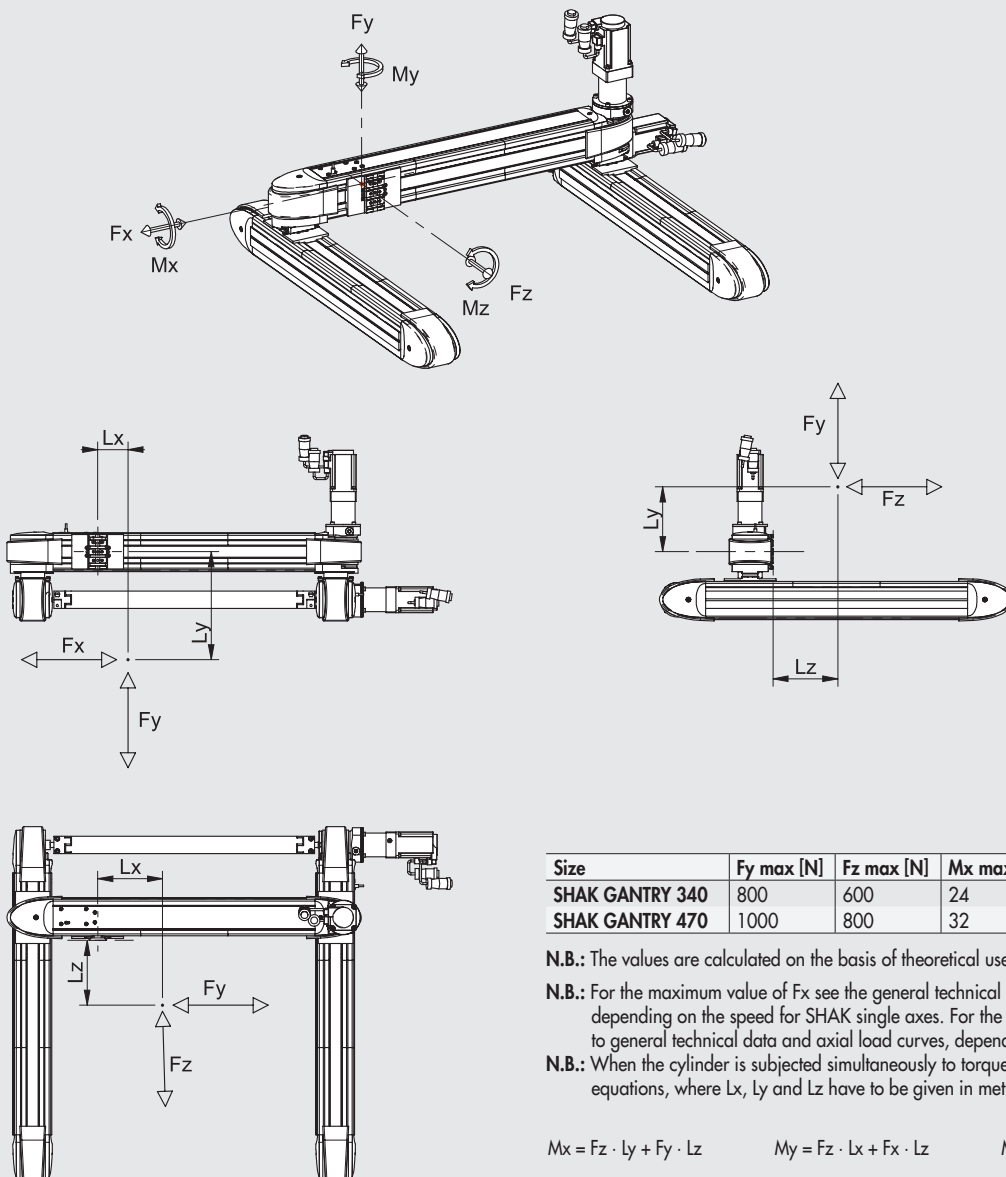


DIAGRAM OF FORCES AND MOMENTS



Size	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
SHAK GANTRY 340	800	600	24	42	52
SHAK GANTRY 470	1000	800	32	50	70

N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

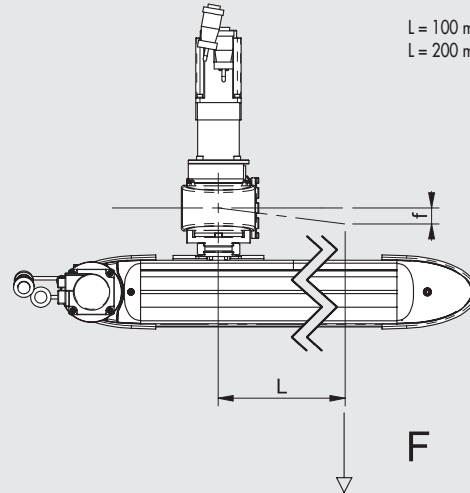
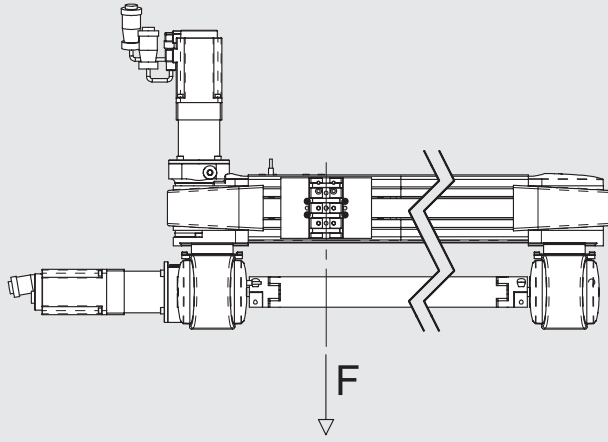
N.B.: For the maximum value of Fx see the general technical data and the axial load curves depending on the speed for SHAK single axes. For the maximum value of Fz, please also refer to general technical data and axial load curves, depending on the speed for SHAK portal axes.

N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where Lx, Ly and Lz have to be given in metre.

$$M_x = F_z \cdot L_y + F_y \cdot L_z \quad M_y = F_z \cdot L_x + F_x \cdot L_z \quad M_z = F_y \cdot L_x + F_x \cdot L_y$$

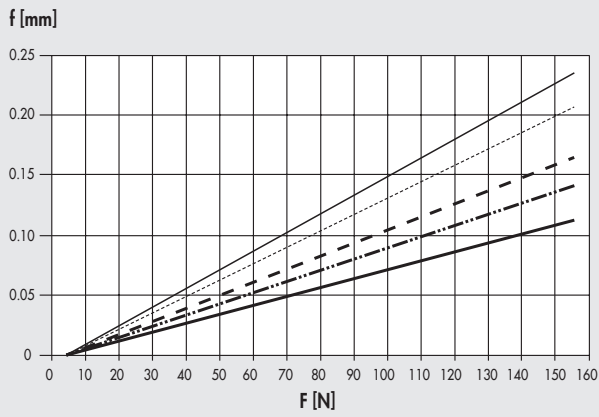
$$\frac{(M_x)}{M_{x \max}} + \frac{(M_y)}{M_{y \max}} + \frac{(M_z)}{M_{z \max}} + \frac{(F_y)}{F_{y \max}} + \frac{(F_z)}{F_{z \max}} \leq 1 \text{ e } \frac{(F_x)}{2F_{y \max}} \leq 1$$

DEFORMATION ACCORDING TO LOAD



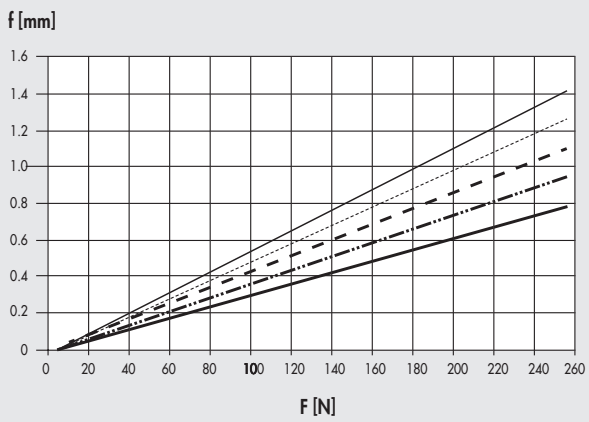
L = 100 mm for SHAK GANTRY 340
L = 200 mm for SHAK GANTRY 470

SHAK GANTRY 340



- Stroke Y 400
- · - · - Stroke Y 600
- - - - - Stroke Y 800
- · · · · Stroke Y 1000
- Stroke Y 1200

SHAK GANTRY 470



- Stroke Y 600
- · - · - Stroke Y 1000
- - - - - Stroke Y 1400
- · · · · Stroke Y 1800
- Stroke Y 2200

AVERAGE TRAVERSE TIMES

N.B.: Check that the following constraints are met for each cycle phase:

- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia).

SHAK GANTRY 340 TRAVERSE TIMES

Size	Stroke X - Stroke Y	t X [s]	t Y [s]
340	400 - 400	0.50	0.45
	400 - 600		0.50
	400 - 800		0.60
	400 - 1000		0.70
	400 - 1200		0.80
	600 - 400	0.60	0.45
	600 - 600		0.50
	600 - 800		0.60
	600 - 1000		0.70
	600 - 1200		0.80
	800 - 400	0.70	0.45
	800 - 600		0.50
	800 - 800		0.60
	800 - 1000		0.70
	800 - 1200		0.80
	1000 - 400	0.80	0.45
	1000 - 600		0.50
	1000 - 800		0.60
	1000 - 1000		0.70
	1000 - 1200		0.80
1200 - 400	0.90	0.45	
1200 - 600		0.50	
1200 - 800		0.60	
1200 - 1000		0.70	
1200 - 1200		0.80	

N.B.: Maximum moving mass 15 kg

SHAK GANTRY 470 TRAVERSE TIMES

Size	Stroke X - Stroke Y	t X [s]	t Y [s]
470	800 - 600	0.90	0.55
	800 - 1000		0.75
	800 - 1400		0.90
	800 - 1800		1.00
	800 - 2200		1.20
	1200 - 600	1.20	0.55
	1200 - 1000		0.75
	1200 - 1400		0.90
	1200 - 1800		1.00
	1200 - 2200		1.20
	1600 - 600	1.40	0.55
	1600 - 1000		0.75
	1600 - 1400		0.90
	1600 - 1800		1.00
	1600 - 2200		1.20
	2000 - 600	1.75	0.55
	2000 - 1000		0.75
	2000 - 1400		0.90
	2000 - 1800		1.00
	2000 - 2200		1.20
2400 - 600	2.00	0.55	
2400 - 1000		0.75	
2400 - 1400		0.90	
2400 - 1800		1.00	
2400 - 2200		1.20	

N.B.: Maximum moving mass 25 kg

Traverse times relate to operation with motors supplied by Metal Work, using max. 200% of the rated torque.

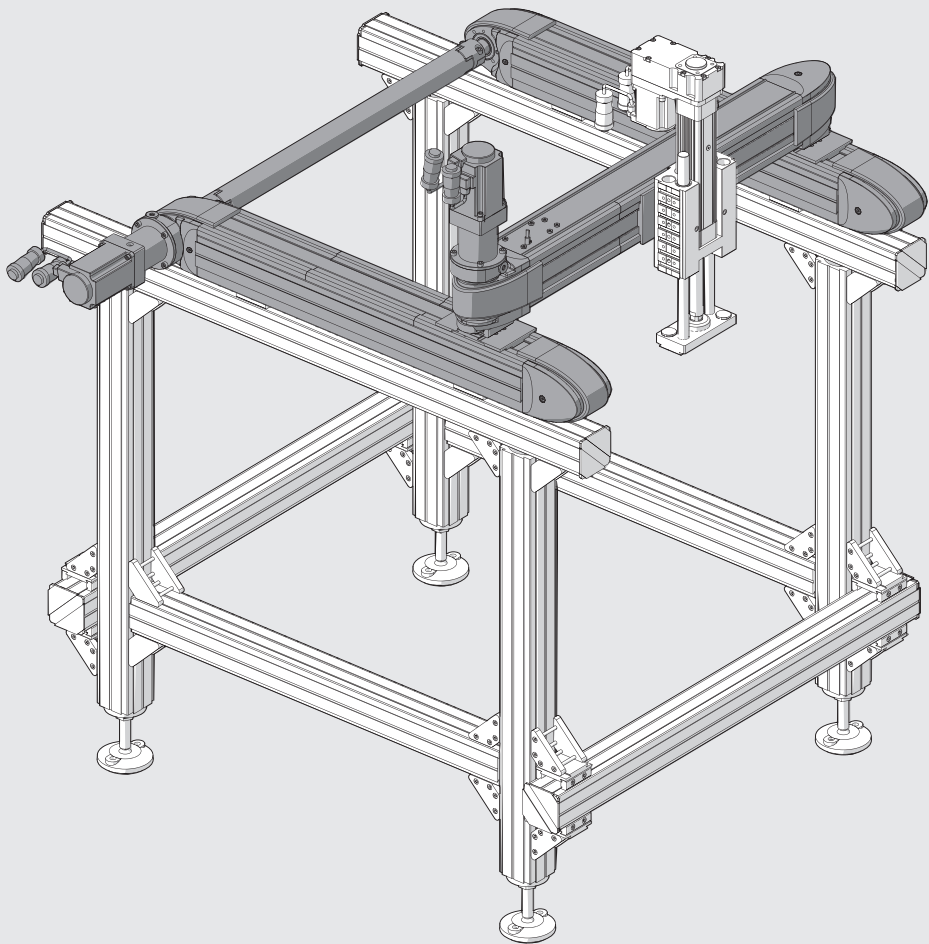
EXAMPLE:

Average traverse times with SHAK GANTRY 340, 800-1200.

The following can be obtained from the tables: tX = 0.7 and tY = 0.80

NOTES

EXAMPLES OF APPLICATION



ACTUATORS

ELECTRIC AXIS SERIES ELEKTRO SHAK GANTRY

NOTES

Blank area for notes with horizontal lines.

DIMENSIONS SHAK GANTRY 340

VERSION WITH MOTORS ON THE RIGHT-HAND SIDE

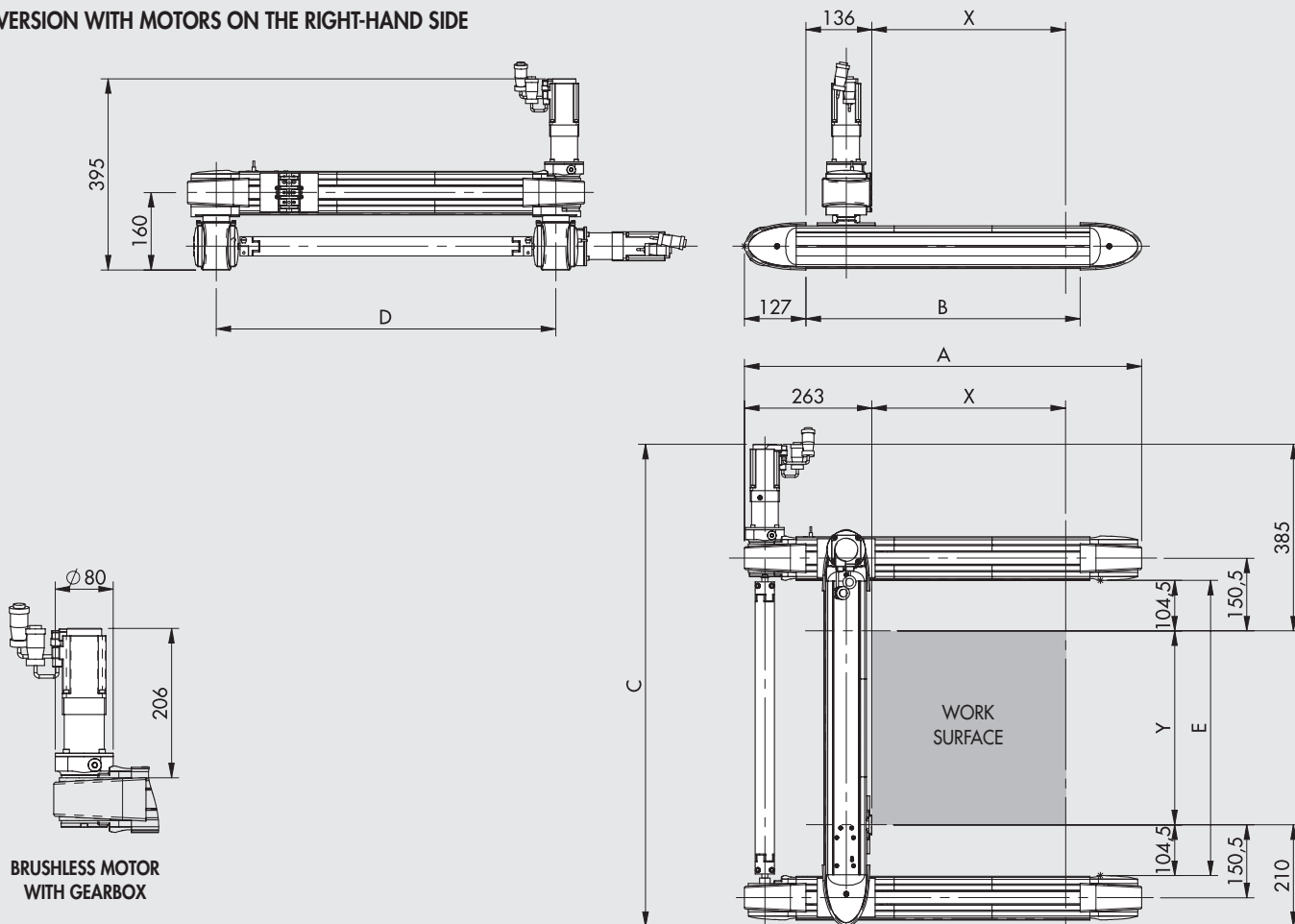


Table of dimensions referring to the version with motors on the right. The version with motor on the left is specular.

Code	Description	X	Y	A	B	C	D	E
375G1040004001_200	SHAK GANTRY-340-X400-Y400	400	400	820	566	996	701	609
375G1040006001_200	SHAK GANTRY-340-X400-Y600	400	600	820	566	1196	901	809
375G1040008001_200	SHAK GANTRY-340-X400-Y800	400	800	820	566	1396	1101	1009
375G1040010001_200	SHAK GANTRY-340-X400-Y1000	400	1000	820	566	1596	1301	1209
375G1040012001_200	SHAK GANTRY-340-X400-Y1200	400	1200	820	566	1796	1501	1409
375G1060004001_200	SHAK GANTRY-340-X600-Y400	600	400	1020	766	996	701	609
375G1060006001_200	SHAK GANTRY-340-X600-Y600	600	600	1020	766	1196	901	809
375G1060008001_200	SHAK GANTRY-340-X600-Y800	600	800	1020	766	1396	1101	1009
375G1060010001_200	SHAK GANTRY-340-X600-Y1000	600	1000	1020	766	1596	1301	1209
375G1060012001_200	SHAK GANTRY-340-X600-Y1200	600	1200	1020	766	1796	1501	1409
375G1080004001_200	SHAK GANTRY-340-X800-Y400	800	400	1220	966	996	701	609
375G1080006001_200	SHAK GANTRY-340-X800-Y600	800	600	1220	966	1196	901	809
375G1080008001_200	SHAK GANTRY-340-X800-Y800	800	800	1220	966	1396	1101	1009
375G1080010001_200	SHAK GANTRY-340-X800-Y1000	800	1000	1220	966	1596	1301	1209
375G1080012001_200	SHAK GANTRY-340-X800-Y1200	800	1200	1220	966	1796	1501	1409
375G1100004001_200	SHAK GANTRY-340-X1000-Y400	1000	400	1420	1166	996	701	609
375G1100006001_200	SHAK GANTRY-340-X1000-Y600	1000	600	1420	1166	1196	901	809
375G1100008001_200	SHAK GANTRY-340-X1000-Y800	1000	800	1420	1166	1396	1101	1009
375G1100010001_200	SHAK GANTRY-340-X1000-Y1000	1000	1000	1420	1166	1596	1301	1209
375G1100012001_200	SHAK GANTRY-340-X1000-Y1200	1000	1200	1420	1166	1796	1501	1409
375G1120004001_200	SHAK GANTRY-340-X1200-Y400	1200	400	1620	1366	996	701	609
375G1120006001_200	SHAK GANTRY-340-X1200-Y600	1200	600	1620	1366	1196	901	809
375G1120008001_200	SHAK GANTRY-340-X1200-Y800	1200	800	1620	1366	1396	1101	1009
375G1120010001_200	SHAK GANTRY-340-X1200-Y1000	1200	1000	1620	1366	1596	1301	1209
375G1120012001_200	SHAK GANTRY-340-X1200-Y1200	1200	1200	1620	1366	1796	1501	1409

N.B.: _ To complete the code, enter 1 for motors on the left and 2 for motors on the right

DIMENSIONS SHAK GANTRY 470

VERSION WITH MOTORS ON THE RIGHT-HAND SIDE

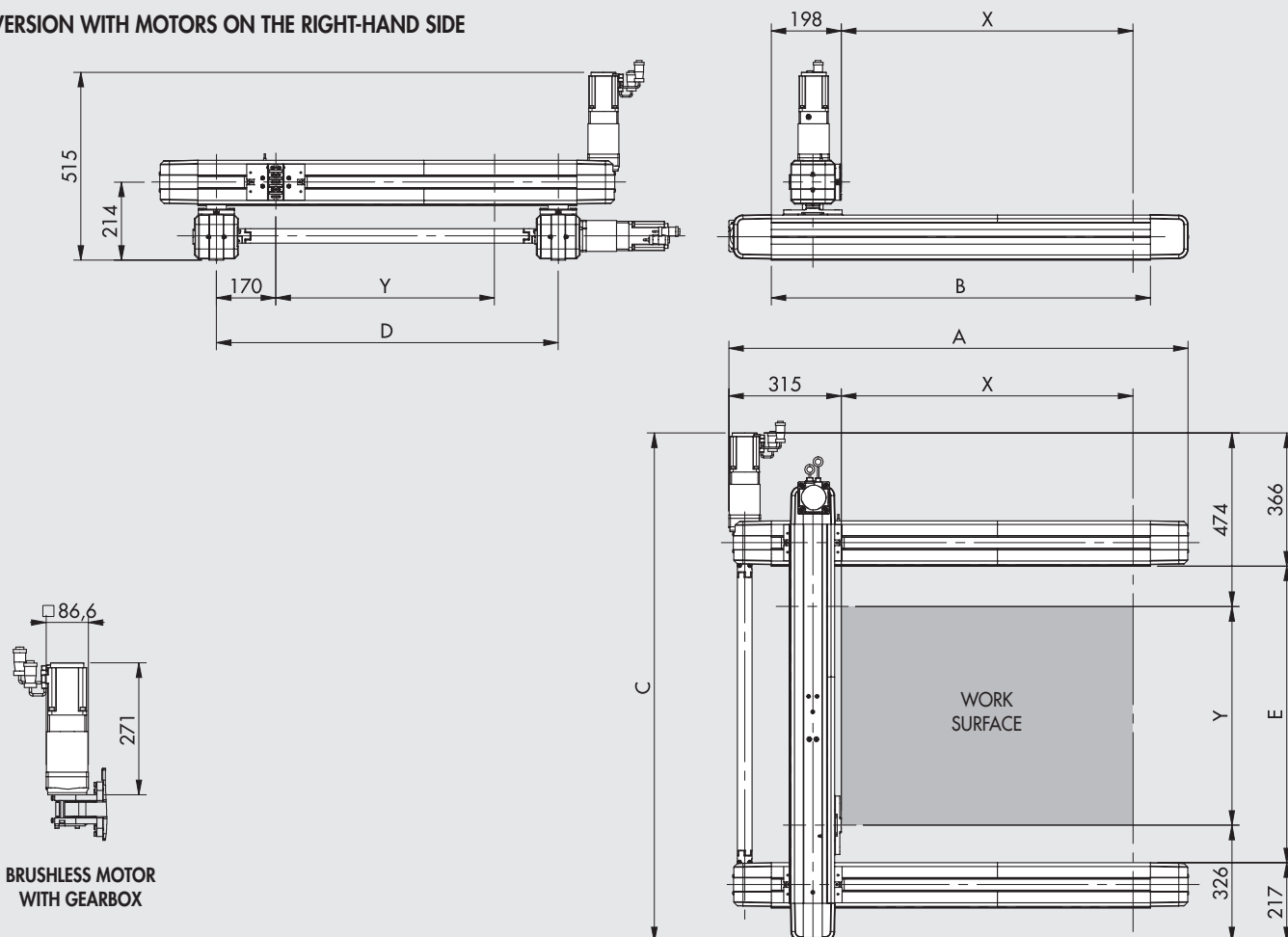


Table of dimensions referring to the version with motors on the right. The version with motor on the left is specular.

Code	Description	X	Y	A	B	C	D	E
375G208006001_200	SHAK GANTRY-470-X800-Y600	800	600	1260	1040	1400	940	817
375G2080010001_200	SHAK GANTRY-470-X800-Y1000	800	1000	1260	1040	1800	1340	1217
375G2080014001_200	SHAK GANTRY-470-X800-Y1400	800	1400	1260	1040	2200	1740	1617
375G2080018001_200	SHAK GANTRY-470-X800-Y1800	800	1800	1260	1040	2600	2140	2017
375G2080022001_200	SHAK GANTRY-470-X800-Y2200	800	2200	1260	1040	3000	2540	2417
375G2120006001_200	SHAK GANTRY-470-X1200-Y600	1200	600	1660	1440	1400	940	817
375G2120010001_200	SHAK GANTRY-470-X1200-Y1000	1200	1000	1660	1440	1800	1340	1217
375G2120014001_200	SHAK GANTRY-470-X1200-Y1400	1200	1400	1660	1440	2200	1740	1617
375G2120018001_200	SHAK GANTRY-470-X1200-Y1800	1200	1800	1660	1440	2600	2140	2017
375G2120022001_200	SHAK GANTRY-470-X1200-Y2200	1200	2200	1660	1440	3000	2540	2417
375G2160006001_200	SHAK GANTRY-470-X1600-Y600	1600	600	2060	1840	1400	940	817
375G2160010001_200	SHAK GANTRY-470-X1600-Y1000	1600	1000	2060	1840	1800	1340	1217
375G2160014001_200	SHAK GANTRY-470-X1600-Y1400	1600	1400	2060	1840	2200	1740	1617
375G2160018001_200	SHAK GANTRY-470-X1600-Y1800	1600	1800	2060	1840	2600	2140	2017
375G2160022001_200	SHAK GANTRY-470-X1600-Y2200	1600	2200	2060	1840	3000	2540	2417
375G2200006001_200	SHAK GANTRY-470-X2000-Y600	2000	600	2460	2240	1400	940	817
375G2200010001_200	SHAK GANTRY-470-X2000-Y1000	2000	1000	2460	2240	1800	1340	1217
375G2200014001_200	SHAK GANTRY-470-X2000-Y1400	2000	1400	2460	2240	2200	1740	1617
375G2200018001_200	SHAK GANTRY-470-X2000-Y1800	2000	1800	2460	2240	2600	2140	2017
375G2200022001_200	SHAK GANTRY-470-X2000-Y2200	2000	2200	2460	2240	3000	2540	2417
375G2240006001_200	SHAK GANTRY-470-X2400-Y600	2400	600	2860	2640	1400	940	817
375G2240010001_200	SHAK GANTRY-470-X2400-Y1000	2400	1000	2860	2640	1800	1340	1217
375G2240014001_200	SHAK GANTRY-470-X2400-Y1400	2400	1400	2860	2640	2200	1740	1617
375G2240018001_200	SHAK GANTRY-470-X2400-Y1800	2400	1800	2860	2640	2600	2140	2017
375G2240022001_200	SHAK GANTRY-470-X2400-Y2200	2400	2200	2860	2640	3000	2540	2417

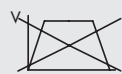
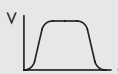
N.B.: _ To complete the code, enter 1 for motors on the left and 2 for motors on the right

MOTOR-DRIVE COUPLINGS



MOTOR CODES		DRIVES CODES	
		Metal Work	37D2400008
		Manufacturer	SANYO DENKI RS3A03
Metal Work	Manufacturer		(30A 400-750 W)
37M2220000	SANYO DENKI R2AA06040FXH1 1M (400W)		SHAK GANTRY 340
37M2330000	SANYO DENKI R2AA08075FXH1 1M (750W)		SHAK GANTRY 470

The motor must be controlled in such a way as to avoid sudden changes in speed.



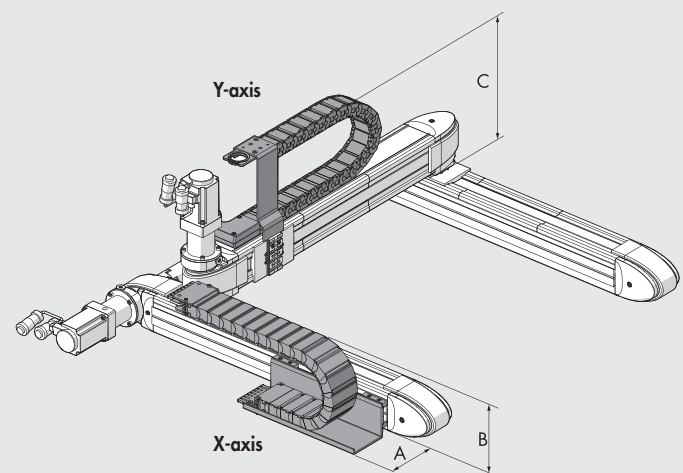
KEY TO CODES

CYL	37 TYPE	5	G	1 SIZE	0800 X-AXIS STROKE ◆	0600 Y-AXIS STROKE ◆	1 REDUCTION *	1 MOTORS POSITION	200 DRIVE
37	Electric actuators	5 SHAK electric axes	G GANTRY	1 Size 340	400 600 800 1000 1200	400 600 800 1000 1200	1 1:5 ratio (X axis) 1:3 ratio (Y axis)	1 Left 2 Right	2 BRUSHLESS motor 0 Standard
				2 Size 470	800 1200 1600 2000 2400	600 1000 1400 1800 2200			0 Standard

- ◆ For standard combinations, please refer to dimensional drawings.
- * On request, the versions with gearbox are available with reduction ratios other than those foreseen as standard.

ACCESSORIES

CABLE TRAY CHAIN



	SHAK GANTRY 340	SHAK GANTRY 470
A	95	120
B	180	182
C	275	310

WARNING! The chain cannot be mounted on versions with motor or geared motor on the right

ASSE X	Code	Description
	095340B0400	Cable tray chain kit, SHAK GANTRY 340 - X400 X-axis
	095340B0600	Cable tray chain kit, SHAK GANTRY 340 - X600 X-axis
	095340B0800	Cable tray chain kit, SHAK GANTRY 340 - X800 X-axis
	095340B1000	Cable tray chain kit, SHAK GANTRY 340 - X1000 X-axis
	095340B1200	Cable tray chain kit, SHAK GANTRY 340 - X1200 X-axis
	095470B0800	Cable tray chain kit, SHAK GANTRY 470 - X800 X-axis
	095470B1200	Cable tray chain kit, SHAK GANTRY 470 - X1200 X-axis
	095470B1600	Cable tray chain kit, SHAK GANTRY 470 - X1600 X-axis
	095470B2000	Cable tray chain kit, SHAK GANTRY 470 - X2000 X-axis
	095470B2400	Cable tray chain kit, SHAK GANTRY 470 - X2400 X-axis
	095340A0400	Cable tray chain kit, SHAK GANTRY 340 - Y400 Y-axis
	095340A0600	Cable tray chain kit, SHAK GANTRY 340 - Y600 Y-axis
	095340A0800	Cable tray chain kit, SHAK GANTRY 340 - Y800 Y-axis
	095340A1000	Cable tray chain kit, SHAK GANTRY 340 - Y1000 Y-axis
	095340A1200	Cable tray chain kit, SHAK GANTRY 340 - Y1200 Y-axis
	095470A0800	Cable tray chain kit, SHAK GANTRY 470 - Y600 Y-axis
	095470A1200	Cable tray chain kit, SHAK GANTRY 470 - Y1000 Y-axis
	095470A1600	Cable tray chain kit, SHAK GANTRY 470 - Y1400 Y-axis
	095470A2000	Cable tray chain kit, SHAK GANTRY 470 - Y1800 Y-axis
	095470A2400	Cable tray chain kit, SHAK GANTRY 470 - Y2200 Y-axis

DRIVES



For motor-drive couplings see table on page A5.102

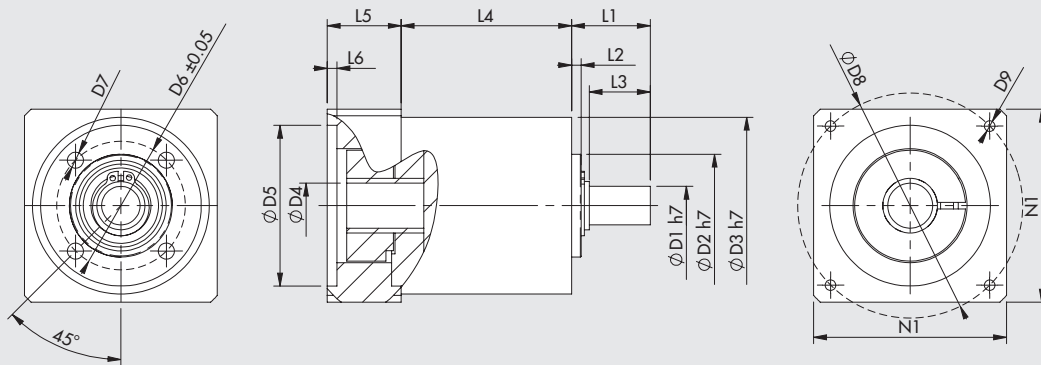
OIL



Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

SPARE PARTS

SHAK GANTRY GEARBOXES



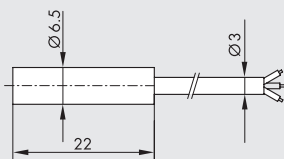
Code	Description	Application	C _{OUT} nominal [Nm]	N _{IN} nominal [1/min]	J reduced to motor shaft [kgmm ²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0541000	Gearbox MP053 1:5	SHAK GANTRY 340 (X axis)	15	3500	6	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0543000	Gearbox MP080 1:5	SHAK GANTRY 470 (X axis)	50	3200	37	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80
37R0341000	Gearbox MP053 1:3	SHAK GANTRY 340 (Y axis)	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0343000	Gearbox MP080 1:3	SHAK GANTRY 470 (Y axis)	40	2900	59	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80

C_{OUT} = coppia nominale in uscita

N_{IN} = velocità nominale in ingresso

J = momento d'inerzia del riduttore

SHAK INDUCTIVE SENSOR



Code	Description
095340A0000	SHAK inductive sensor accessory kit

ELECTRIC MOTORS



For motor-drive couplings see table on page A5.102