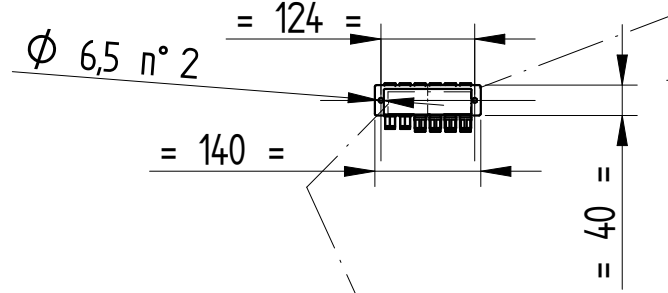
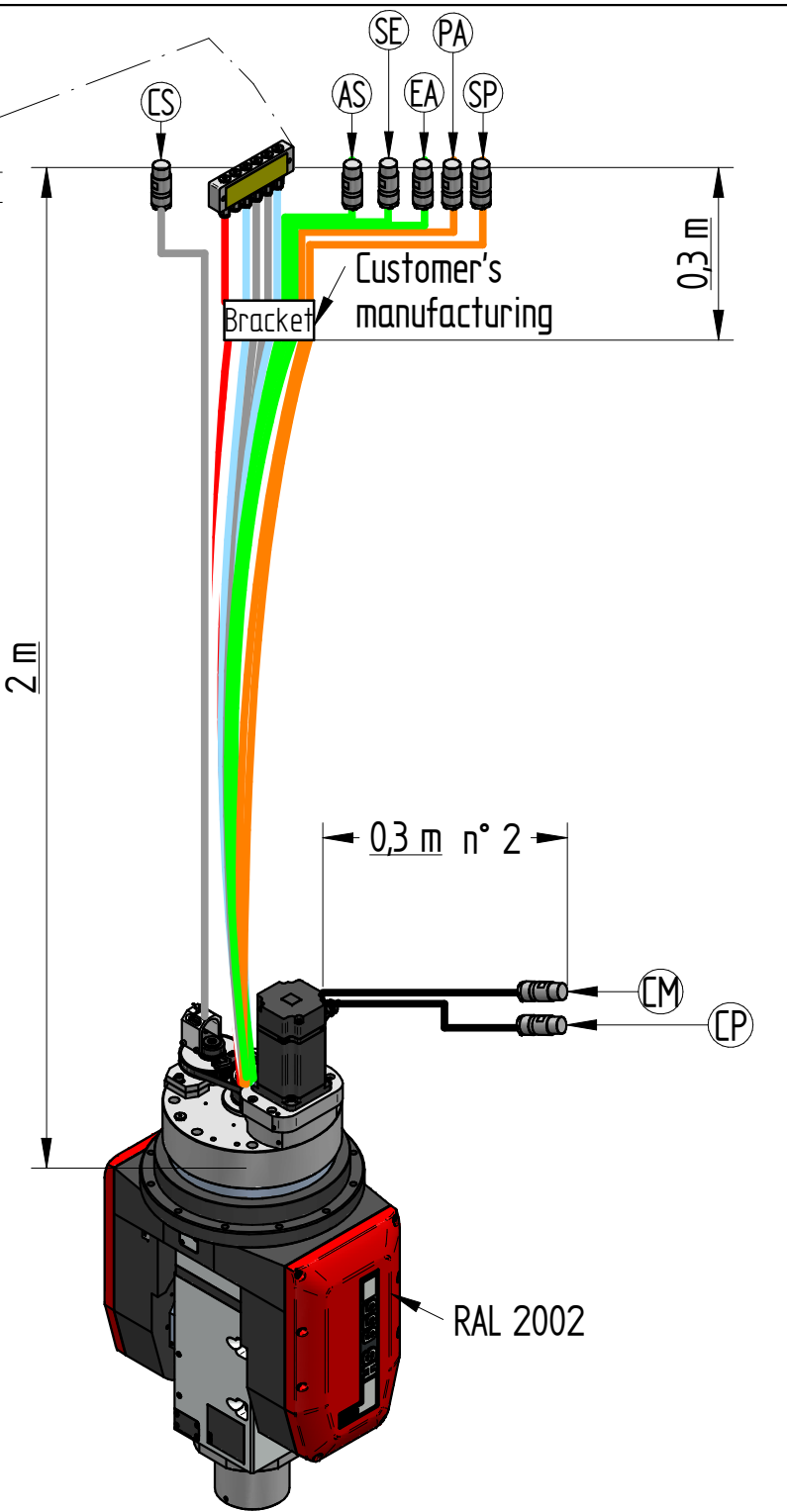


SEZIONE/SECTION C-C
1:5

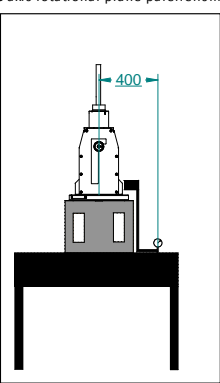


- 1423H0217
- 1 Pressurization
Pressurizzazione
Verdichtung
 - 2 Tool release
Sbloccaggio utensile
Werkzeugabspannung
 - 3 Fluid to tool
Fluido raffredd. utensile
Kühlflüssigkeit für Werkzeug
 - 4 Cooling IN
Ingresso acqua raffreddam.
Wassereintritt Kühlkreis
 - 5 Cooling OUT
Uscita acqua raffreddam.
Wasseraustritt Kühlkreis
 - 6 Fluid to tool
Fluido raffredd. utensile
Kühlflüssigkeit für Werkzeug

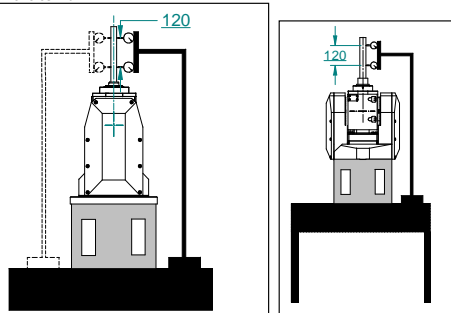


				HSD DIVISION		
				A3		
REV.	DESCRIZIONE REVISIONE / REVISION DESCRIPTION			N°REV	DATA / DATE	FIRMA / SIGN
	DISEGNATO / DRAWN BY	CONTROLLATO / CHECKED BY	APPROVATO / APPROVED	PESO / WEIGHT : 170 kg	SCALA / SCALE : 1:10	FOGLIO / SHEET : 1 / 2
DATA DATE	121216	121216		GREZZO DI / RAW :	QUOTE SENZA INDICAZIONE DI TOLLERANZA POSITIONS WITHOUT TOLERANCE INFORMATION	
FIRMA SIGN	FoganteAndrea	MemoliSandro			- LAVORAZIONI MECCANICHE / MECHANICAL WORKINGS : UNI EN 22768-mK	
MATERIALE / MATERIAL :					- SALDOCARPENTERIE / WELDMENT :	
TRATTAMENTO TERMICO / HEAT TREATMENT :					- GETTI / MELT CASTING :	
RIVESTIMENTO SUPERFICIALE / SURFACE TREATMENT :					CICLO DI VERNICIATURA / PAINTING CYCLE :	
DENOMINAZIONE / DESCRIPTION :	hs655sgmev es789f63-1v			CODICE ABRIGI / DRAWING N°	9489H0046	REVISIONE / REVISION 0

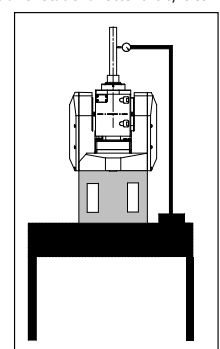
C-axis rotational plane parallelism with the granite referential plane: 0.03 max



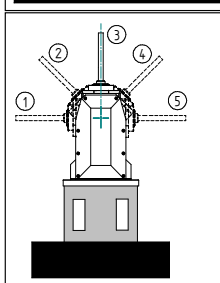
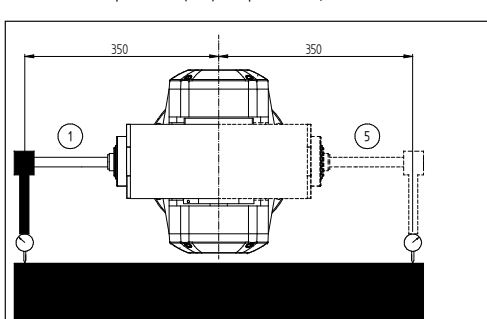
After setting the zero on the 2 comparators on the left, inclination of the spindle axis: 0.03 max



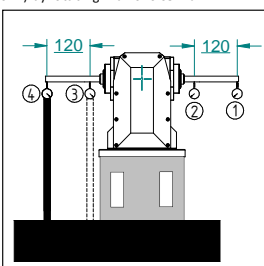
C-axis rotational eccentricity: 0.03 max



Variance between position 1 (or 5) and positions 2, 3 & 4: 0.1 max



After setting the zero on the positions 1 and 2, variance between 1 (or 2) and 3 (or 4) by rotating A-axis: 0.05 max



Cable reference	CS	EA	AS	SE	CM	CP	PA	SP																																																																																																																																																																																							
Tag	"C sensors"	"ENCODER A"	"A sensors Spindle sensors"	"SPINDLE ENCODER"	C-axis motor-encoder	C-axis power	"POWER A"	"SPINDLE POWER"																																																																																																																																																																																							
Colour	Grey	Green	Green	Black	Black	Orange	Orange	Orange																																																																																																																																																																																							
D (mm)	5.7	7.0	9.0	9.4	6.0	7.0	9.2	14.8																																																																																																																																																																																							
Size required (mm*2 min)	5 X 0.14 + Shield	2 X 0.35 + 1 X 2 X 0.25 + Shield	7 X 0.14 + 2 X 0.25 + Shield	3 X 2 X 0.15 + 2 X 0.15 + Shield	2 X 0.35 + 1 X 2 X 0.25 + Shield	4 X 0.5 + Shield	4 X 0.5 + Shield	4 X AWG 10 + Shield																																																																																																																																																																																							
Connector size	M23	M23	M23	M23	M23	M23	M23	M40																																																																																																																																																																																							
Machine-side connector (code)	Female connector supplied (H2138H0056)	Female connector supplied (H2138H0056)	Female connector supplied (H2138H0056)	Female connector supplied (H2138H0056)	Female connector NOT supplied	Female connector NOT supplied	Female connector supplied (H2138H0045)	Female connector supplied (H2138H0058)																																																																																																																																																																																							
Head-spindle connector layout																																																																																																																																																																																															
Connector pinout	<table border="1"> <tr><td>1</td><td>/</td></tr> <tr><td>2</td><td>/</td></tr> <tr><td>3</td><td>24 V-DC</td></tr> <tr><td>4</td><td>0</td></tr> <tr><td>5</td><td>/</td></tr> <tr><td>6</td><td>/</td></tr> <tr><td>7</td><td>/</td></tr> <tr><td>8</td><td>/</td></tr> <tr><td>9</td><td>/</td></tr> <tr><td>10</td><td>/</td></tr> <tr><td>11</td><td>/</td></tr> <tr><td>12</td><td>C-axis positive overtravel</td></tr> <tr><td>13</td><td>C-axis negative overtravel</td></tr> <tr><td>14</td><td>C-axis reference</td></tr> <tr><td>15</td><td>/</td></tr> <tr><td>16</td><td>/</td></tr> <tr><td>17</td><td>/</td></tr> <tr><td>Case</td><td>Shield</td></tr> </table>	1	/	2	/	3	24 V-DC	4	0	5	/	6	/	7	/	8	/	9	/	10	/	11	/	12	C-axis positive overtravel	13	C-axis negative overtravel	14	C-axis reference	15	/	16	/	17	/	Case	Shield	<table border="1"> <tr><td>1</td><td>/</td></tr> <tr><td>2</td><td>Data +</td></tr> <tr><td>3</td><td>Data -</td></tr> <tr><td>4</td><td>/</td></tr> <tr><td>5</td><td>/</td></tr> <tr><td>6</td><td>5 V-DC</td></tr> <tr><td>7</td><td>0</td></tr> <tr><td>8</td><td>/</td></tr> <tr><td>9</td><td>/</td></tr> <tr><td>10</td><td>/</td></tr> <tr><td>11</td><td>/</td></tr> <tr><td>12</td><td>/</td></tr> <tr><td>13</td><td>/</td></tr> <tr><td>14</td><td>/</td></tr> <tr><td>15</td><td>/</td></tr> <tr><td>16</td><td>/</td></tr> <tr><td>17</td><td>/</td></tr> <tr><td>Case</td><td>Shield</td></tr> </table>	1	/	2	Data +	3	Data -	4	/	5	/	6	5 V-DC	7	0	8	/	9	/	10	/	11	/	12	/	13	/	14	/	15	/	16	/	17	/	Case	Shield	<table border="1"> <tr><td>1</td><td>Piston forward</td></tr> <tr><td>2</td><td>Tool clamped</td></tr> <tr><td>3</td><td>/</td></tr> <tr><td>4</td><td>24 V-DC</td></tr> <tr><td>5</td><td>/</td></tr> <tr><td>6</td><td>0</td></tr> <tr><td>7</td><td>Temperature+</td></tr> <tr><td>8</td><td>Temperature-</td></tr> <tr><td>9</td><td>A-axis positive overtravel</td></tr> <tr><td>10</td><td>A-axis negative overtravel</td></tr> <tr><td>11</td><td>A-axis reference</td></tr> <tr><td>12</td><td>/</td></tr> <tr><td>13</td><td>/</td></tr> <tr><td>14</td><td>/</td></tr> <tr><td>15</td><td>/</td></tr> <tr><td>16</td><td>/</td></tr> <tr><td>17</td><td>/</td></tr> <tr><td>Case</td><td>Shield</td></tr> </table>	1	Piston forward	2	Tool clamped	3	/	4	24 V-DC	5	/	6	0	7	Temperature+	8	Temperature-	9	A-axis positive overtravel	10	A-axis negative overtravel	11	A-axis reference	12	/	13	/	14	/	15	/	16	/	17	/	Case	Shield	<table border="1"> <tr><td>1</td><td>5 V-DC</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>A+</td></tr> <tr><td>4</td><td>B+</td></tr> <tr><td>5</td><td>Z+</td></tr> <tr><td>6</td><td>A-</td></tr> <tr><td>7</td><td>B-</td></tr> <tr><td>8</td><td>Z-</td></tr> <tr><td>9</td><td>0</td></tr> <tr><td>10</td><td>/</td></tr> <tr><td>11</td><td>/</td></tr> <tr><td>12</td><td>/</td></tr> <tr><td>13</td><td>/</td></tr> <tr><td>14</td><td>/</td></tr> <tr><td>15</td><td>/</td></tr> <tr><td>16</td><td>/</td></tr> <tr><td>17</td><td>/</td></tr> <tr><td>Case</td><td>Shield</td></tr> </table>	1	5 V-DC	2	0	3	A+	4	B+	5	Z+	6	A-	7	B-	8	Z-	9	0	10	/	11	/	12	/	13	/	14	/	15	/	16	/	17	/	Case	Shield	<table border="1"> <tr><td>1</td><td>U phase</td></tr> <tr><td>2</td><td>V phase</td></tr> <tr><td>3</td><td>Ground</td></tr> <tr><td>4</td><td>W phase</td></tr> <tr><td>5</td><td>/</td></tr> <tr><td>6</td><td>/</td></tr> <tr><td>Case</td><td>Shield</td></tr> </table>	1	U phase	2	V phase	3	Ground	4	W phase	5	/	6	/	Case	Shield	<table border="1"> <tr><td>1</td><td>U phase</td></tr> <tr><td>2</td><td>V phase</td></tr> <tr><td>3</td><td>Ground</td></tr> <tr><td>4</td><td>W phase</td></tr> <tr><td>5</td><td>/</td></tr> <tr><td>6</td><td>/</td></tr> <tr><td>Case</td><td>Shield</td></tr> </table>	1	U phase	2	V phase	3	Ground	4	W phase	5	/	6	/	Case	Shield	<table border="1"> <tr><td>U</td><td>U phase</td></tr> <tr><td>V</td><td>V phase</td></tr> <tr><td>W</td><td>W phase</td></tr> <tr><td>+</td><td>Ground</td></tr> <tr><td>-</td><td>Ground</td></tr> <tr><td>Case</td><td>Shield</td></tr> </table>	U	U phase	V	V phase	W	W phase	+	Ground	-	Ground	Case	Shield
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Encoder	Spindle
Output	Sinusoidal
Voltage (V-DC)	5
Signal	Incremental
Protocol	/
Manufacturer	L+B
Ring model	ZA N 3 0256 012.0
Sensor model	2443 K N 1 G 3 K 030 - E-
Counts per revolution	256
References per rev.	1
Max. output f (kHz)	/
Max. feedback speed (rpm)	/

Pipe reference	/					
Tag	"1 Pressurization"	"2 Tool release"	"3 Fluid to tool"	"4 Cooling IN"	"5 Cooling OUT"	"6 Fluid to tool"
Colour	Red	White	Transparent blue	Neutral	Neutral	Transparent blue
Fluid	Air	Air	/	Water+glycol	Water+glycol	/
D_int min (mm)	4	4	6	6	6	6
p_in (bar)	4	12	10 max	5 max	/	10 max
Flow rate (L/min)	15	/	/	5 min	/	/
V needed (cm³)	/	150	/	/	/	/
D (mm)	6	6	8	8	8	8
Connection needed	Male G1/8	Male G1/8	Male G1/8	Male G1/8	Male G1/8	Male G1/8

Reduction gear box	C-axis	A-axis	Motor	C-axis	A-axis
Manufacturer	Nabtesco		Yaskawa		
Model	RV-50C-143.98	RV-42N-93	SGMEV - 07 D D A 6 1 / SGMEV - 04 D D A 6 1		
Ratio	(1+52*29/69)*63/10	40*(46/20)+1	20-bit incremental		
Bending stiffness (N m/arcmin)	1960	833	Yaskawa		
Torsional stiffness (N m/arcmin)	255	113	No		
Connectors	Flying		Flying		
Voltage (V-AC)	400		400		

Head-spindle	1341558	
	HS655	
	C-axis	A-axis
Rotation (°)	±245	±120
Mechanical stop	No	Yes
Encoder	No	
Accuracy (arcsec)	60	
Repeatability (arcsec)	20	
Motor	See Motor	
Reduction gear box	Yes (see Reduction gear box)	
Ratio	(1+52*29/69)*6.3 ≈ 144	279
Max. speed (7s)	208	107
Stall torque (N m)	359	418
Max. torque (N m)	1030	1029*
Clamping system	No	
Clamping typology	/	
Clamping torque (N m)	No	
Motor drive	H5801H0069	
Handbook	ES789	
Tool holder	HSK F63	
Encoder	Yes (see Encoder)	
Tool clamping control	Digital	
Handbook	H5803H0005	
Data sheet	H6161H1486	

* Limit the motor to 96% otherwise the reduction gear box could be damaged.

HSD ES 789L 4P 15.00KW

Flüssigkeitsgekühlt Liquid cooling

HSD S.p.A. www.hsd.it
Via della Meccanica, 16
61122 PESARO (Italy)

ASYNCHRONOUS 3-PHASE MOTOR
DRIBSTROM-ASYNCHRONMOTOR
Ta: 20°C
Ins. Cl. F

380V	rpm x 1000	18
300Hz		14,4
9000 rpm		12
S1 continuous 15 kW-20,1 Hp		12
32 A		14,4
S6 60% 18 kW-24,1 Hp		9,6
		8,4
		7
		24

Poles: 4 IP 54

cosφ = 0,87 Kg ○
η = 0,84 36 Kg ○

MAX RPM

18000
 22000
 24000
 28000

IEC 60034-1

Rated voltage	V	253	380	380	380	380
Rated frequency	Hz	200	300	467	600	800
Rated speed	rpm	6000	9000	14000	18000	24000
Duty type		S1 cont	S6 60%	S1 cont	S6 60%	S1 cont
Rated power	kW	12	14.4	15	18	12
Rated torque	Nm	19.1	22.9	15.9	19.1	8.2
Rated current	A	37.4	44.0	32.0	38.0	24.5

REV.	DESCRIZIONE REVISIONE / REVISION DESCRIPTION	N°REV	DATA / DATE	FIRMA / SIGN
DATA DATE	121216	121216		
FIRMA SIGN	FoganteAndrea	MemoliSandro		

RIPRODUZIONE E/O DIFFUSIONE VIETATA
REPRODUCTION AND OR DISCLOSURE OF THE DRAWING IS FORBIDDEN

DISEGNATO / DRAWN BY	CONTROLLATO / CHECKED BY	APPROVATO / APPROVED	PESO / WEIGHT:	170 kg
MATERIALE / MATERIAL:			SCALA / SCALE: 1:10	
TRATTAMENTO TERMICO / HEAT TREATMENT:			FOGLIO / SHEET: 2 / 2	
RIVESTIMENTO SUPERFICIALE / SURFACE TREATMENT:			QUOTE SENZA INDICAZIONE DI TOLLERANZA / POSITIONS WITHOUT TOLERANCE INFORMATION	
DENOMINAZIONE / DESCRIPTION:			- LAVORAZIONI MECCANICHE / MECHANICAL WORKINGS: UNI EN 22768-mK	

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HSD DIVISION

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