

RIG04 - RIG06 - RIG09

RIGIDIAL



- ♦ Compact-size aluminium housing.
- ♦ Large-diameter output plate with flange coupling.
- ♦ Output plate supported by a crossed roller bearing with high load capacities.
- ♦ Output configuration with central through hole and ceiling mounting.
- ♦ Direct keying onboard of the motorisation box with worm screw reduction gear and friction torque limiter incorporated in the reduction gear.
- ♦ Nitrided steel cam.
- ♦ Possibility to assemble in all positions.
- ♦ Long-life lubrication.



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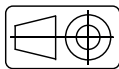
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The units of measure comply with the SI international metric index

General manufacturing tolerances comply with standard UNI – ISO 2768-1 UNI EN 22768-1

Illustrations and drawings according to 3970 (ISO 128-82)

The drawings are represented with the traditional method



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This catalogue supersedes all earlier versions.

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GLOBOIDAL CAM INDEXING TABLES

General

RIGIDIAL tables are globoidal cam indexing tables that transform continuous rotary motion into indexing motion.

The indexing plate rests on a large-diameter crossed roller bearing that can withstand high axial and tilting loads while maintaining excellent levels of accuracy and rigidity.

The cam is nitrided and assures high wear resistance, smooth running, accurate and repeatable positioning without any backlash at the station. A wide range of standard movements is available, including the 2-station movement (180° rotation), which is ideal for tilting or piece exchange applications. The table is highly adaptable to applications in tight spaces and can be mounted in any position. Upon request, the table can be supplied with a central through hub, fixed or rotating. Again upon request, the table can be configured with the output ring for ceiling or upside down mounting. The motorised RIGIDIAL tables are supplied, in the standard version, with a self-braking motor and worm reduction gear with friction torque limiting device. This device contributes to making the table safe, preventing damages that may be caused by emergency stops or stoppages of the output plate during the rotation phase.

Operation

RIGIDIAL tables can be used in two different ways:

- **Cycle on demand.**

This is used for applications featuring a long dwell period compared to the indexing period. In this operating mode, the dwell period is determined by means of a cam which, mounted directly on the table input shaft, operates a sensor that signals to the PLC to stop the motor or disengage a clutch-brake unit in the mechanical dwell period of the cam. At the end of the assembly, production and checking operations, the PLC restarts the motor in order to rotate the output plate up to the next station, then waits for the signal that the cam mechanical stop phase has been reached in order to stop the motor once again.

- **Continuous rotation.**

This is used in fast applications where the machine cycle is carried out in one revolution of the input shaft. Each single work operation is synchronised within a particular sector of main shaft rotation. This operating mode is indicated for machines whose movements are actuated exclusively by mechanical drives.

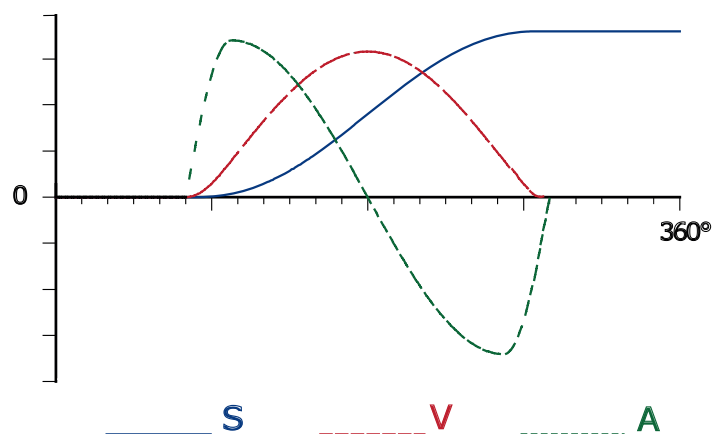


Fig. 1 Example of an SVA (Indexing, Velocity, Acceleration) diagram.



GLOBOIDAL CAM INDEXING TABLES

Sizing of the table

The rotary table is sized starting from a calculation of the torque required at the output. This torque has to take into account the inertia of the customer's application, the moment of friction, and the torques due to external, static or dynamic forces requested at the output.

For the purpose of avoiding vibrations during rotation, it is important to evaluate the ratio of the equivalent ratio of inertia to the pitch radius of the table cam followers.

It is also important to use the proper service factor when sizing the reduction gear.

Examples of applications

The use of this table is equally effective in both linear and rotary indexing systems of small and medium size, where the available space is limited and where very fast indexing movements must have positioning accuracy, repeatability and no vibrations.

Typical examples are: assembly systems, transfer systems, welding systems, etc.

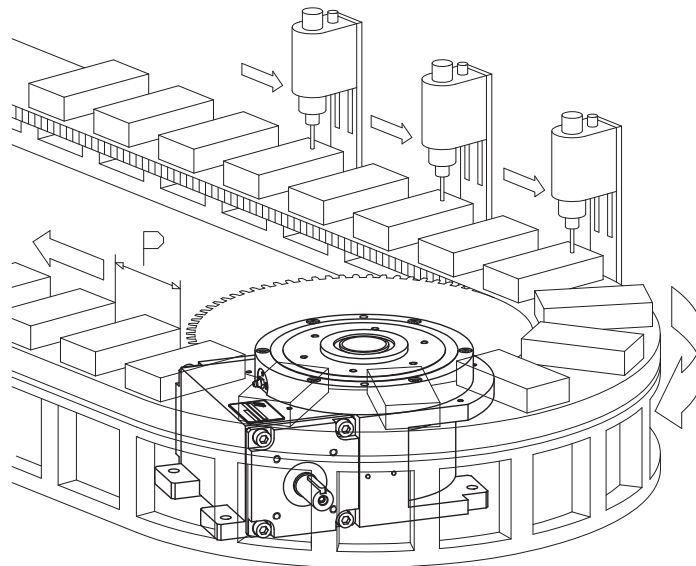


Fig. 2 RIGIDIAL used as an indexing table on an assembly machine.

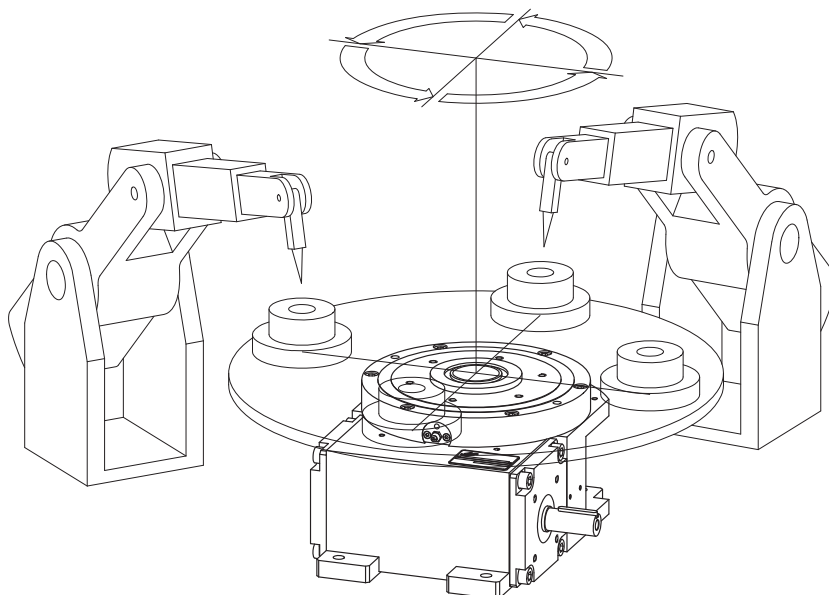


Fig. 3 RIGIDIAL used as a presenting device to a welding robot.



CONFIGURATIONS AND VARIANTS DIAGRAM

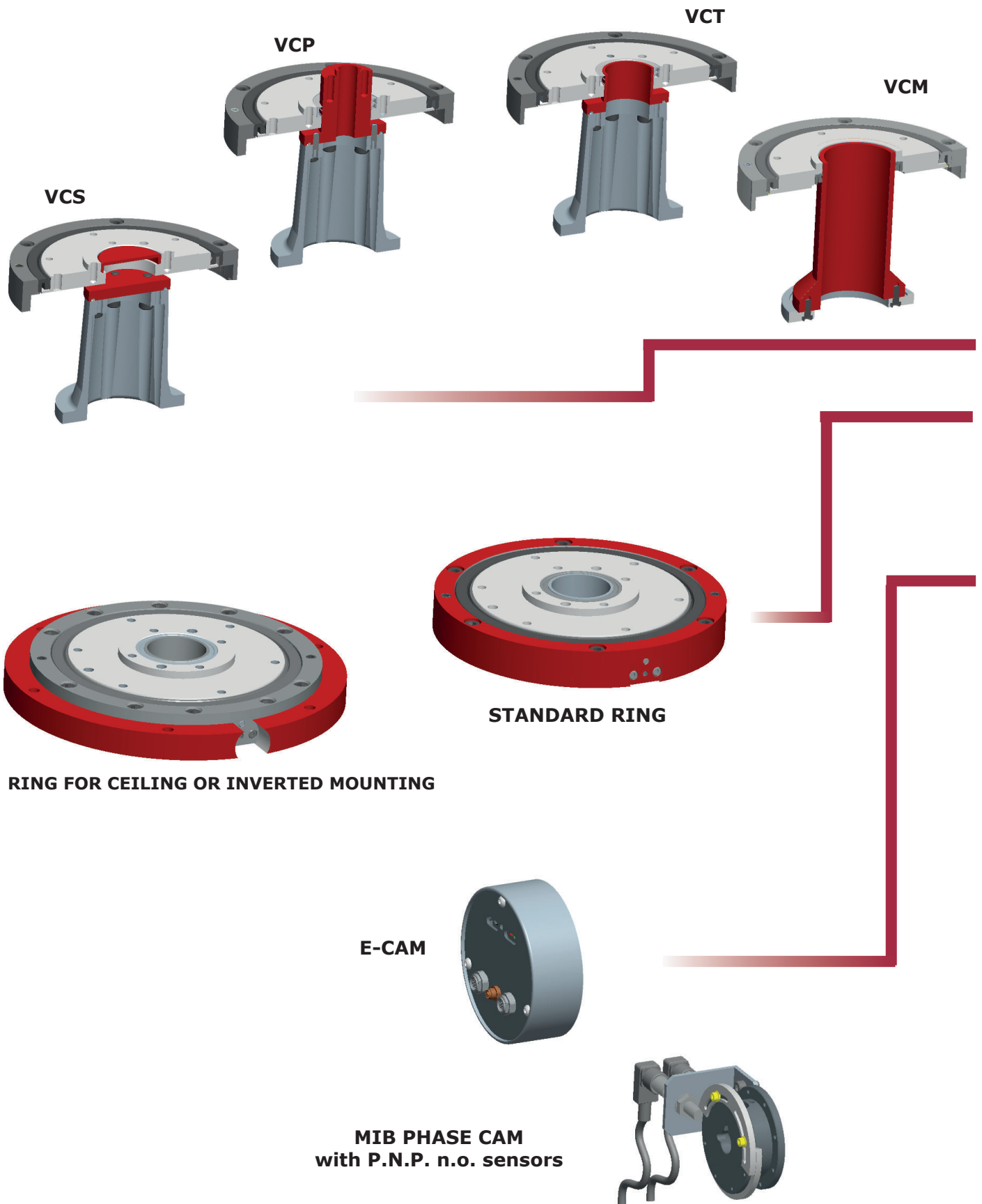
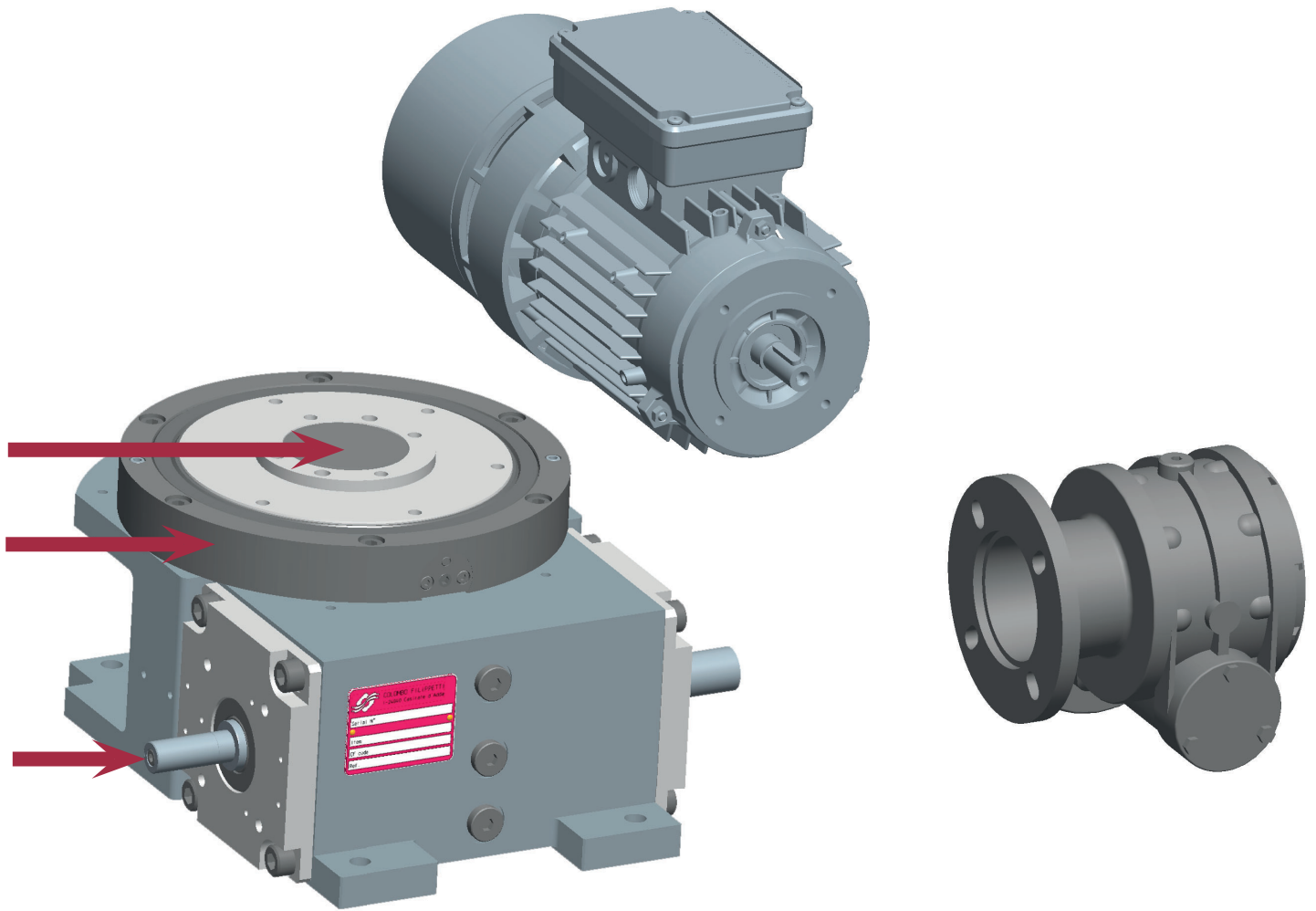


Fig. 4 Diagram of configuration and variants.



STANDARD CONFIGURATION

- Nitrided cam.
- Table centre with cover seal (VCS version).
- Crossed roller bearing ring.
- Universal mounting.
- Worm reduction gear with torque limiter and self-braking motor (see table on page 24).
- MIB or CM4 type cam assembly with double phase switch for consent operation.

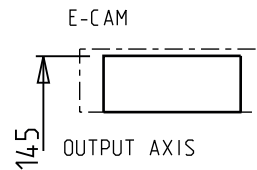
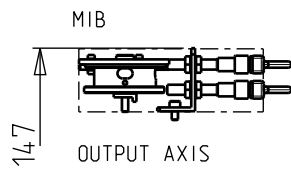
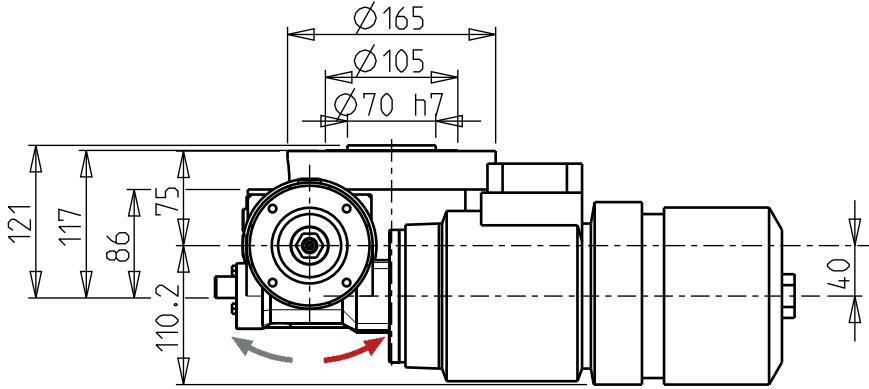
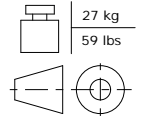
ACCESSORIES AND VARIANTS

- Cam with hardened and ground profile.
- Reversed direction pertaining to the rotation of the motion input shaft-output plate.
- Output version normal fixed central through hole without fixing holes (VCT version).
- Output version with large fixed central through hole without fixing holes (VCM version).
- Output version with projecting fixed central hub, through hole and fixing holes (VCP version).
- Version with ring for ceiling mounting.
- Holes for reference pins on output plate and box.
- Smaller reduction gear.
- Reduction gear with LF-type torque limiter or without limiter.
- Regular motor.
- Motorisation on opposite side of the table.
- Supply of table only without motorisation and micro assembly (VS version).
- E-CAM control system for stopping the table and auxiliary equipment command.



RIG04

RIG04 - CONFIGURATION WITH REDUCTION GEAR AND SELF-BRAKING MOTOR (VLRA)



RIG04

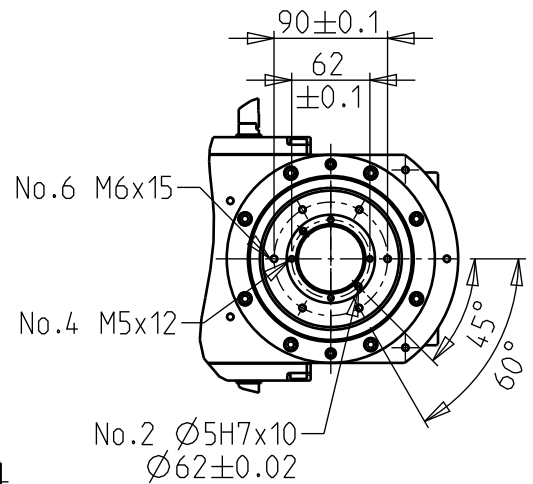
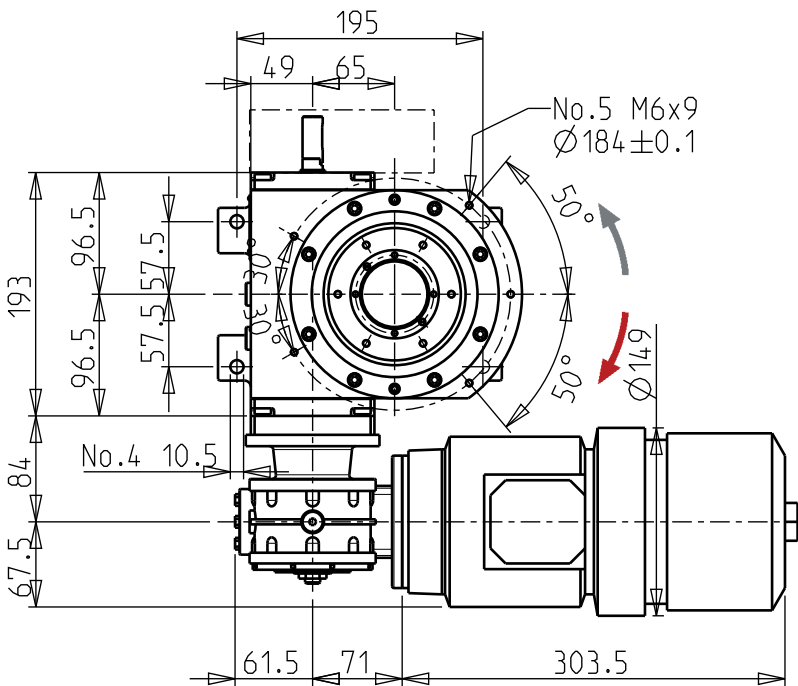


Fig. 5 VLRA Version.

REDUCTION GEAR: RMI 40F1-PAMB14 - LCB

MOTOR: SELF-BRAKING

NOTES

- By reversing the direction of rotation of the input shaft, the direction of rotation of the output shaft is reversed, while the kinematic characteristics of the intermittent motion in standard mechanisms remain unchanged.
- The 6 holes M6x15 on the output plate are in the position shown in Fig. 5 and 6 when the table is in the dwell period at one of the stations.
- The input shaft notches are in the position shown in Fig. 7 when the table is halfway through its dwell period.
- Some combinations of motors and reduction gears limit the performance of the tables.
- Standard direction of rotation (right helix of the cam) as indicated by the arrows.
- The pin with Ø16x44.5 screwed on the input shaft must only be used as support for the control cams of the micro switches.
- On some motors, the terminal box is rotated by 45° compared to the one shown in the drawing.



RIG04 - CONFIGURATION WITH SHORT INPUT SHAFT (VS)

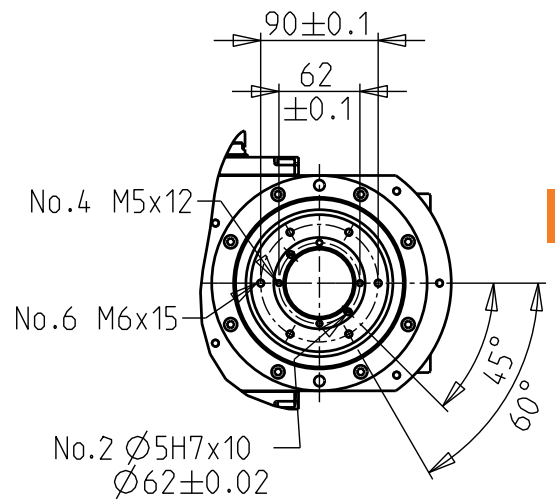
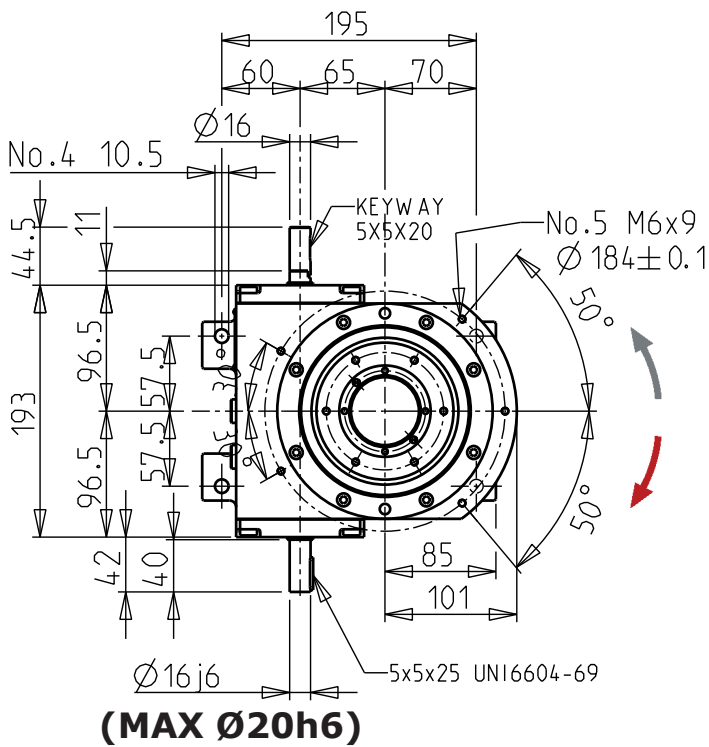
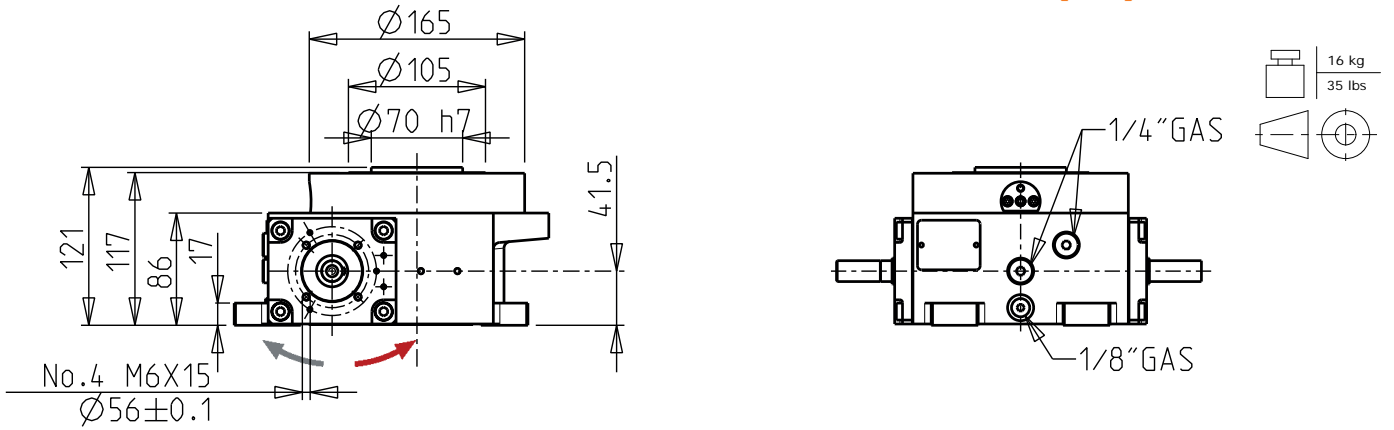


Fig. 6 VS Version.

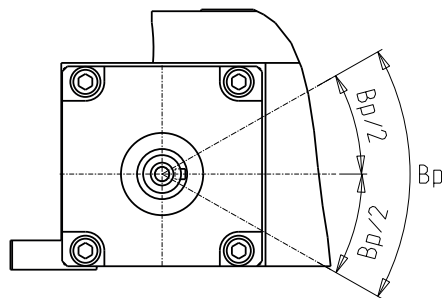


Fig. 7 Cam dwell period.

RIG04	Concentricity		Plate planarity	Division precision			
	Precision	on \varnothing	Precision	Single cycle	Double cycle		
	0.02 mm	70 mm	0.01 mm	$\pm 60''$	± 0.015 mm /50 mm	$\pm 90''$	± 0.02 mm /50 mm



RIG04 - OPTIONAL CONFIGURATIONS OF THE OUTPUT PLATE

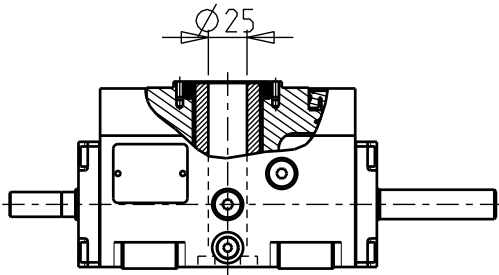


Fig. 8 VCT Version.

VCT VERSION

- Central fixed through hub, without fixing holes.

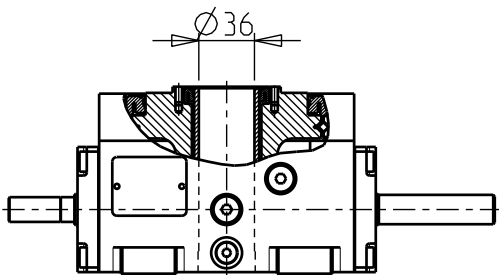
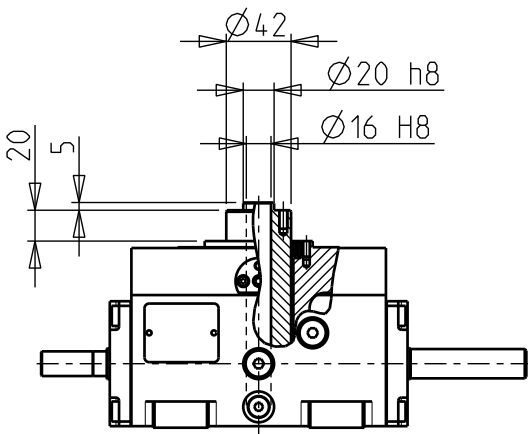


Fig. 9 VCM Version.

VCM VERSION

- Large central fixed through hub, without fixing holes.

RIG04



VERSIONE VCP

- Central fixed through hub, Ø16H8, projection Ø 42x20 and fixing holes with centring Ø 20h8x5.

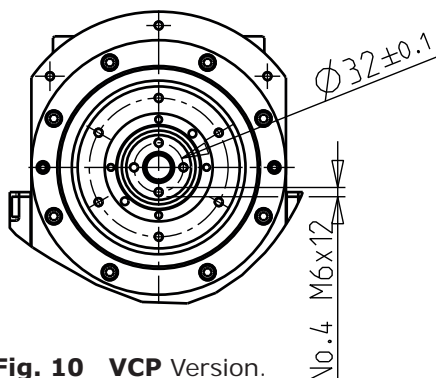


Fig. 10 VCP Version.

No. 4 M6x12



RIG04 - OPTIONAL CONFIGURATION FOR CEILING OR INVERTED MOUNTING

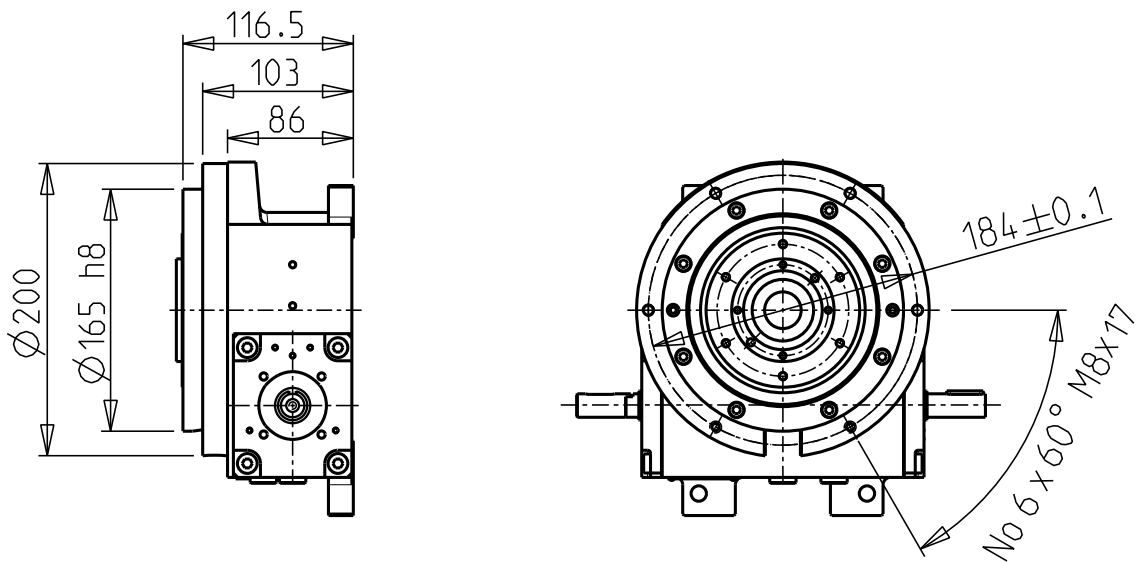
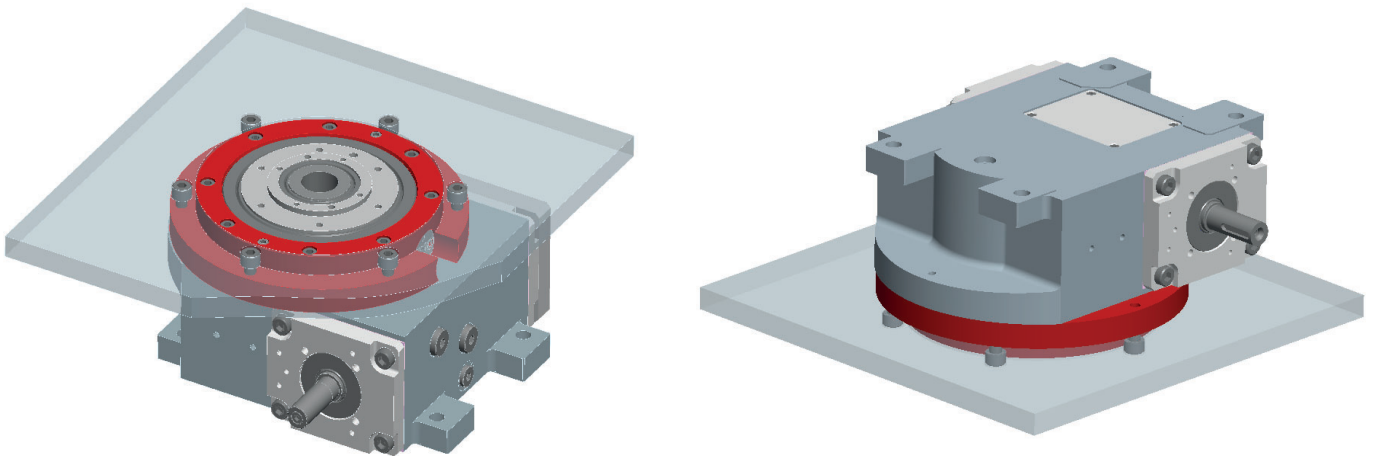
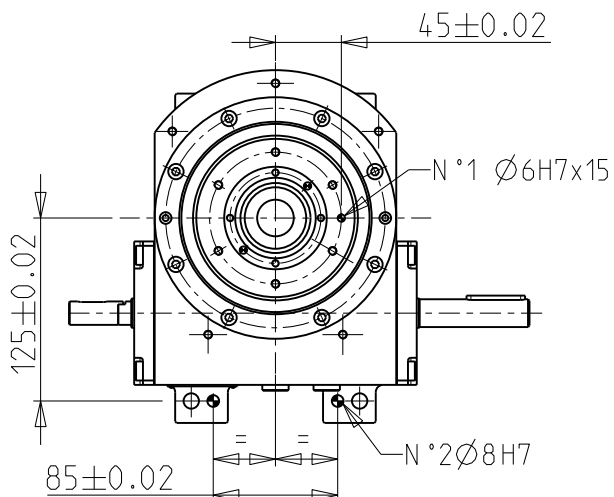


Fig. 11 Configuration for ceiling or upside down mounting VC...S.

RIG04

RIG04 - OPTIONAL REFERENCE HOLES



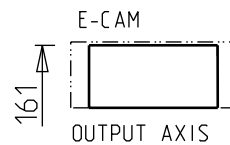
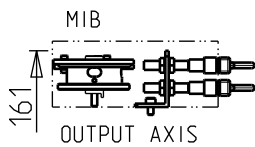
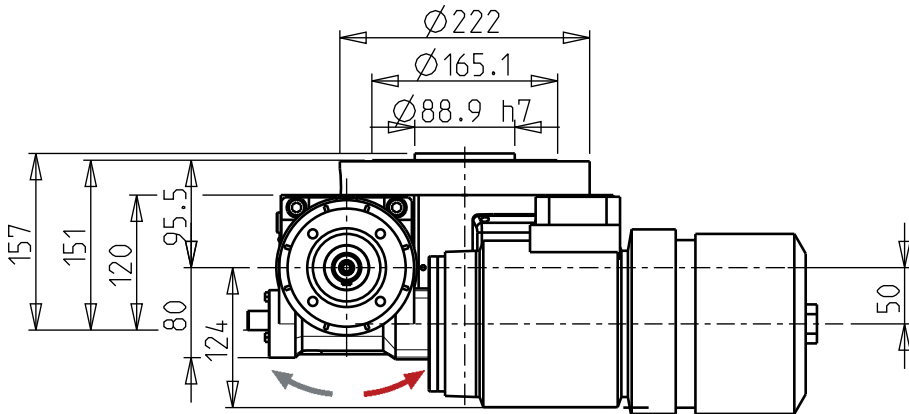
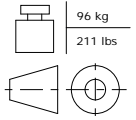
Three dowel holes can be drilled in the output plate and in the table feet, as indicated in Fig. 12. The purpose of the hole in the output plate is to guarantee precise and repeatable assembly of the equipment. The two holes in the feet, on the other hand, allow precise positioning and make the table interchangeable.

Fig. 12 Reference holes.



RIG06

RIG06 - CONFIGURATION WITH REDUCTION GEAR AND SELF-BRAKING MOTOR (VLRA)



RIG06

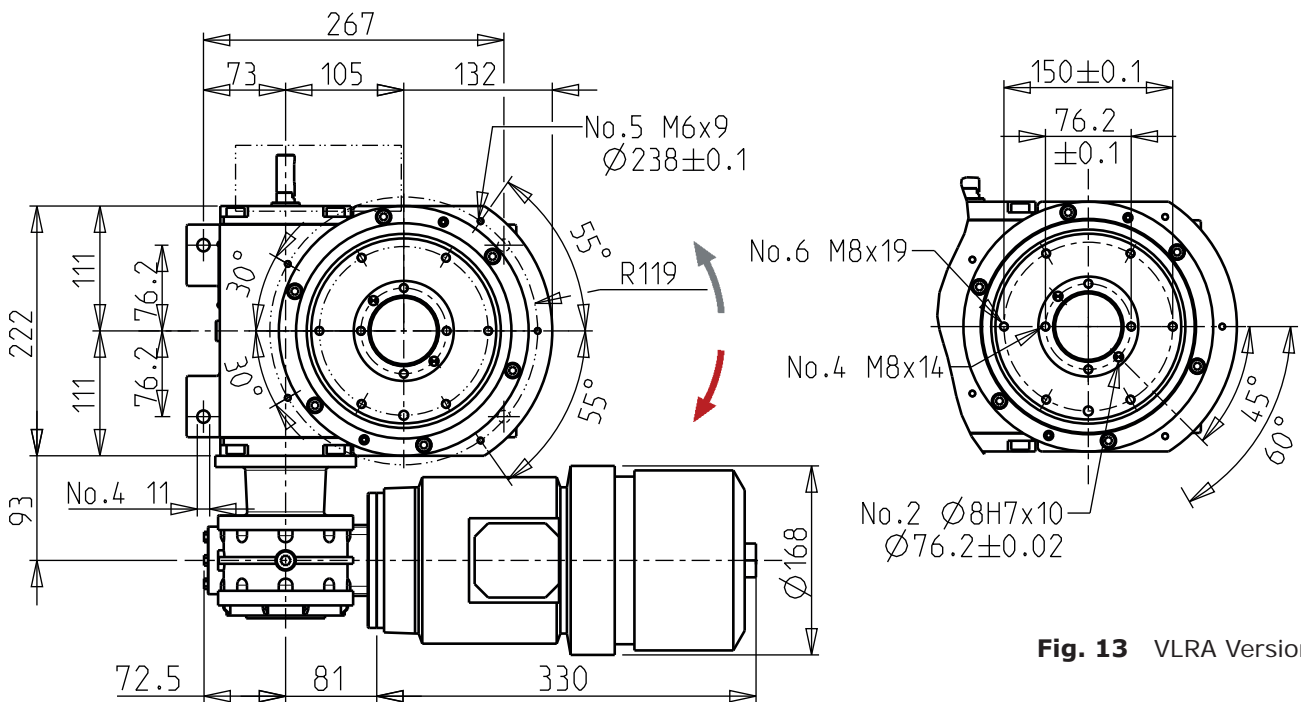


Fig. 13 VLRA Version.

REDUCTION GEAR: RMI 50F1-PAMB14 - LCB

MOTOR: SELF-BRAKING

NOTES

- By reversing the direction of rotation of the input shaft, the direction of rotation of the output shaft is reversed, while the kinematic characteristics of the intermittent motion in standard mechanisms remain unchanged.
- The 6 holes M8x19 on the output plate are in the position shown in Fig. 13 and 14 when the table is in the dwell period at one of the stations.
- The input shaft notches are in the position shown in Fig. 15 when the table is halfway through its dwell period.
- Some combinations of motors and reduction gears limit the performance of the tables.
- Standard direction of rotation (right helix of the cam) as indicated by the arrows.
- The pin with $\varnothing 16 \times 44.5$ screwed on the input shaft must only be used as support for the control cams of the micro switches.
- On some motors, the terminal box is rotated by 45° compared to the one shown in the drawing.



RIG06 - CONFIGURATION WITH SHORT INPUT SHAFT (VS)

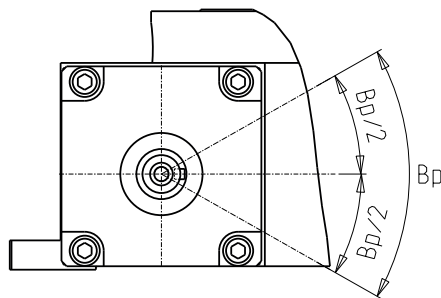
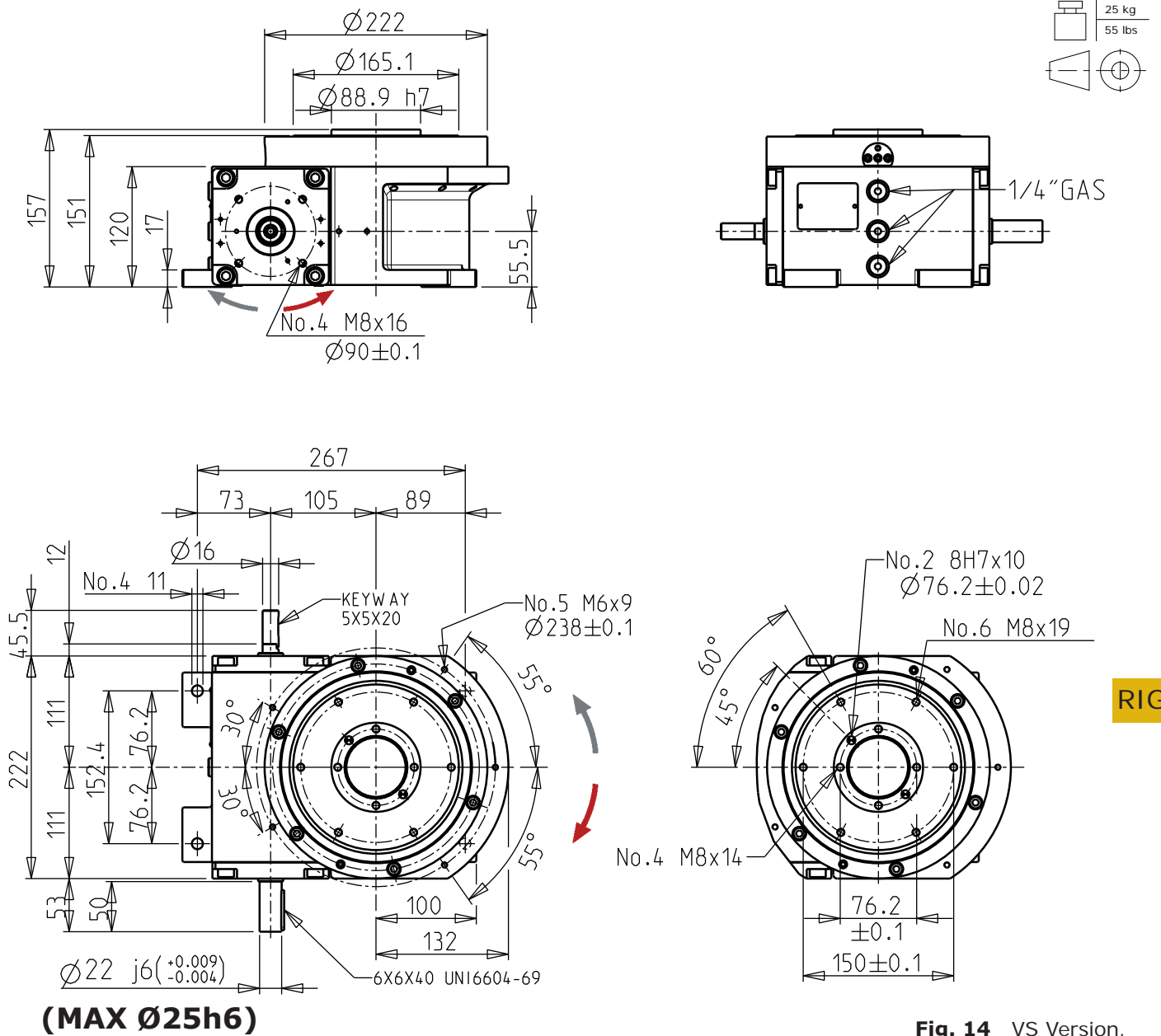


Fig. 15 Cam dwell period.

RIG06	Concentricity		Plate planarity	Division precision		
	Precision	on Ø	Precision	Single cycle		Double cycle
	0.03 mm	88.9 mm	0.01 mm	±30"	±0.015 mm /100 mm	±60"



RIG06 - OPTIONAL CONFIGURATIONS OF THE OUTPUT PLATE

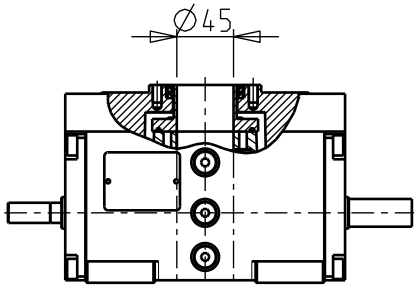


Fig. 16 VCT Version.

VCT VERSION

- Central fixed through hub, without fixing holes.

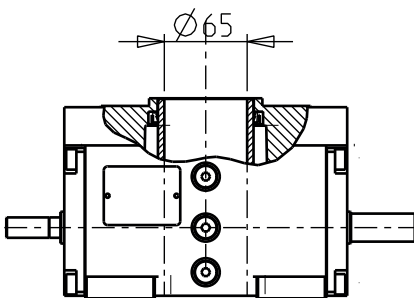
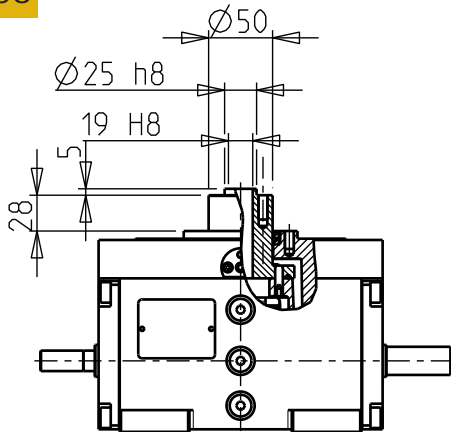


Fig. 17 VCM Version.

VCM VERSION

- Large central fixed through hub, without fixing holes.

RIG06



VCP VERSION

- Central through hub $\varnothing 19H8$, projection $\varnothing 50 \times 28$ and fixing holes with centring $\varnothing 25h8 \times 5$.

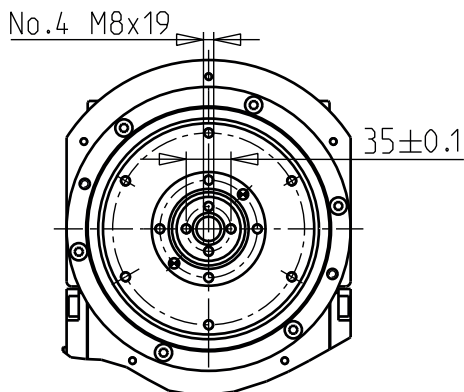
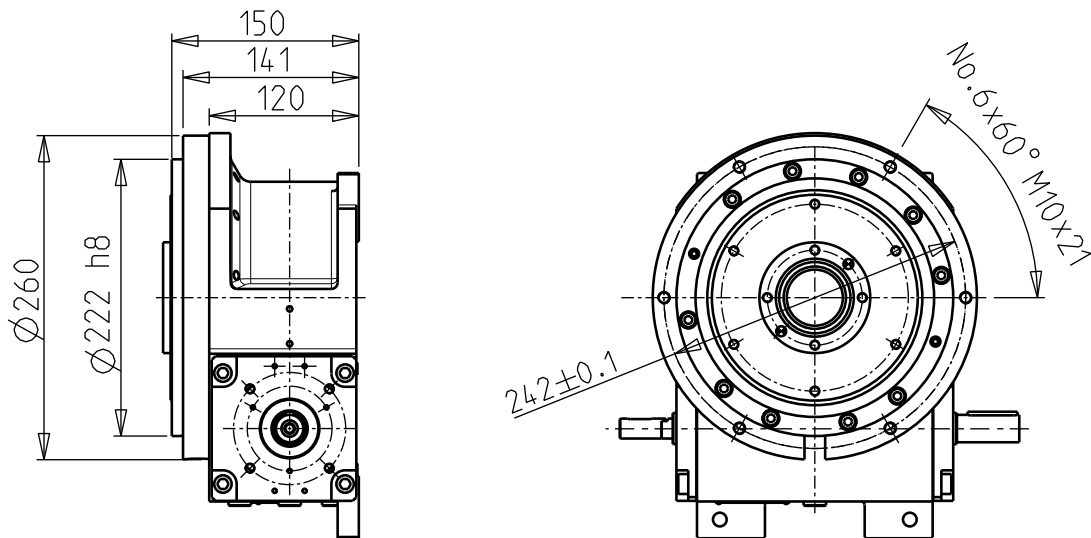
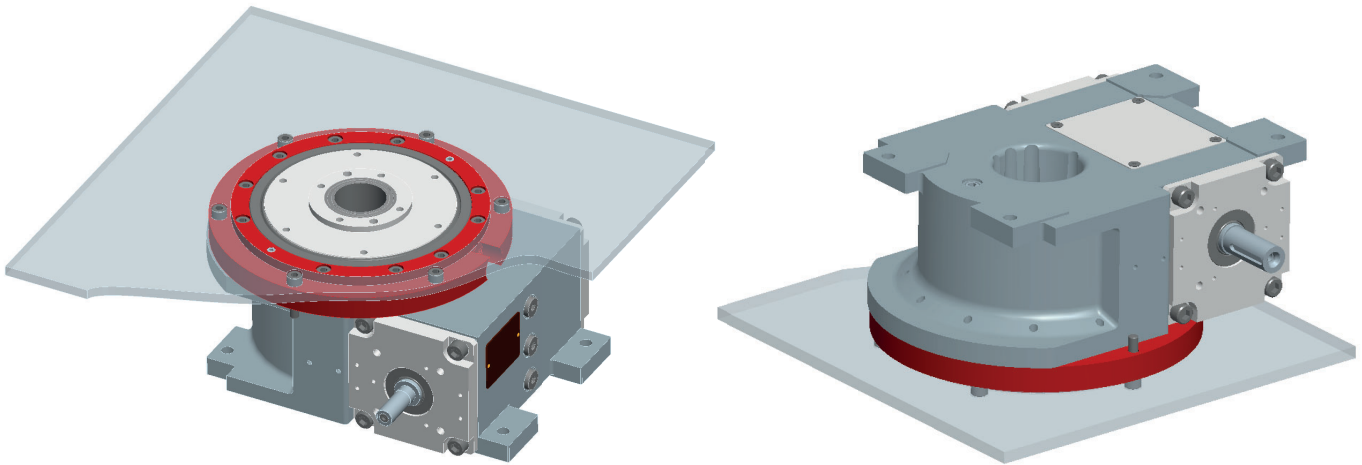


Fig. 18 VCP Version.



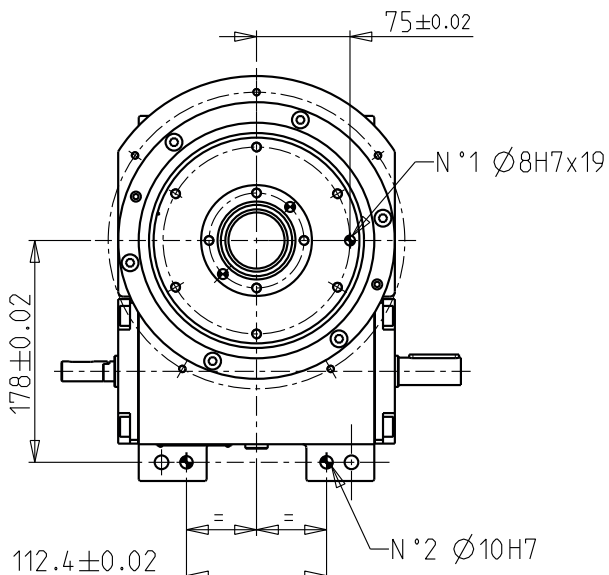
RIG06 - OPTIONAL CONFIGURATION FOR CEILING OR INVERTED MOUNTING



RIG06

Fig. 19 Configuration for ceiling or upside down mounting VC...S.

RIG06 - OPTIONAL REFERENCE HOLES



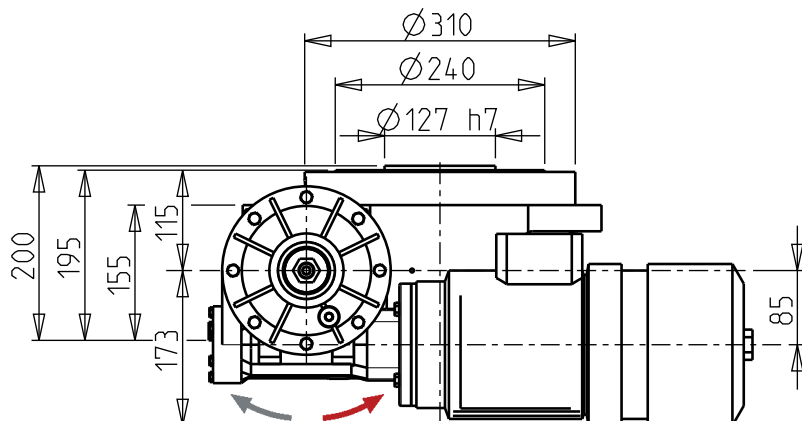
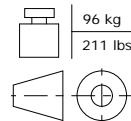
Three dowel holes can be drilled in the output plate and in the table feet, as indicated in Fig. 20. The purpose of the hole in the output plate is to guarantee precise and repeatable assembly of the equipment. The two holes in the feet, on the other hand, allow precise positioning and make the table interchangeable.

Fig. 20 Reference holes.



RIG09

RIG09 - CONFIGURATION WITH REDUCTION GEAR AND SELF-BRAKING MOTOR (VLRA)



RIG09

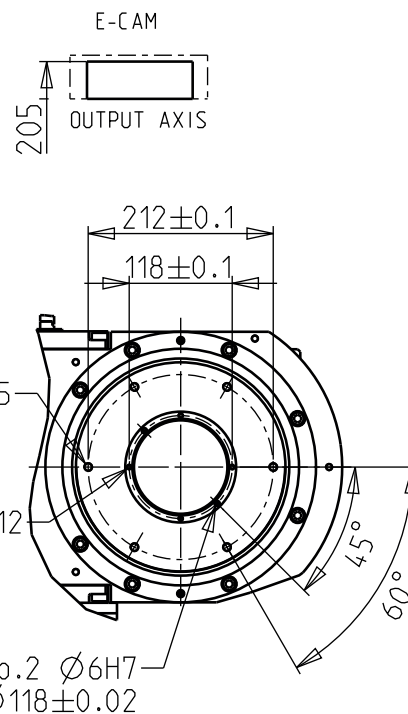
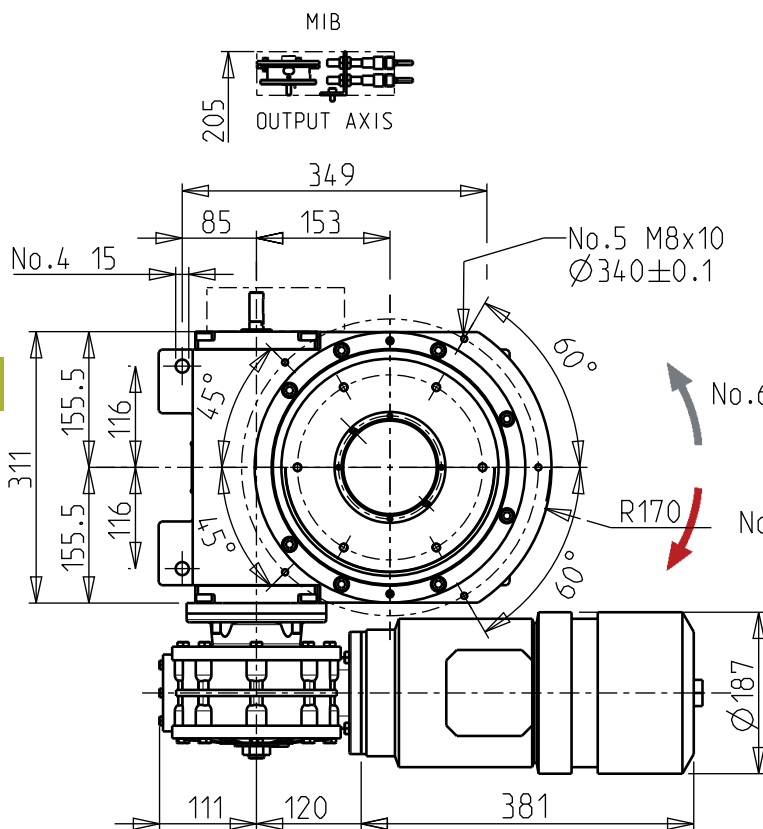


Fig. 21 VLRA Version.

REDUCTION GEAR: RMI 85F3-PAMB14-LCB

MOTOR: SELF-BRAKING

NOTES

- By reversing the direction of rotation of the input shaft, the direction of rotation of the output shaft is reversed, while the kinematic characteristics of the intermittent motion in standard mechanisms remain unchanged.
- The 6 holes M10x25 on the output plate are in the position shown in Fig. 21 and 22 when the table is in the dwell period at one of the stations.
- The input shaft notches are in the position shown in Fig. 23 when the table is halfway through its dwell period.
- Some combinations of motors and reduction gears limit the performance of the tables.
- Standard direction of rotation (right helix of the cam) as indicated by the arrows.
- The pin with Ø16x45 screwed on the input shaft must only be used as support for the control cams of the micro switches.





RIG09 - CONFIGURATION WITH SHORT INPUT SHAFT (VS)

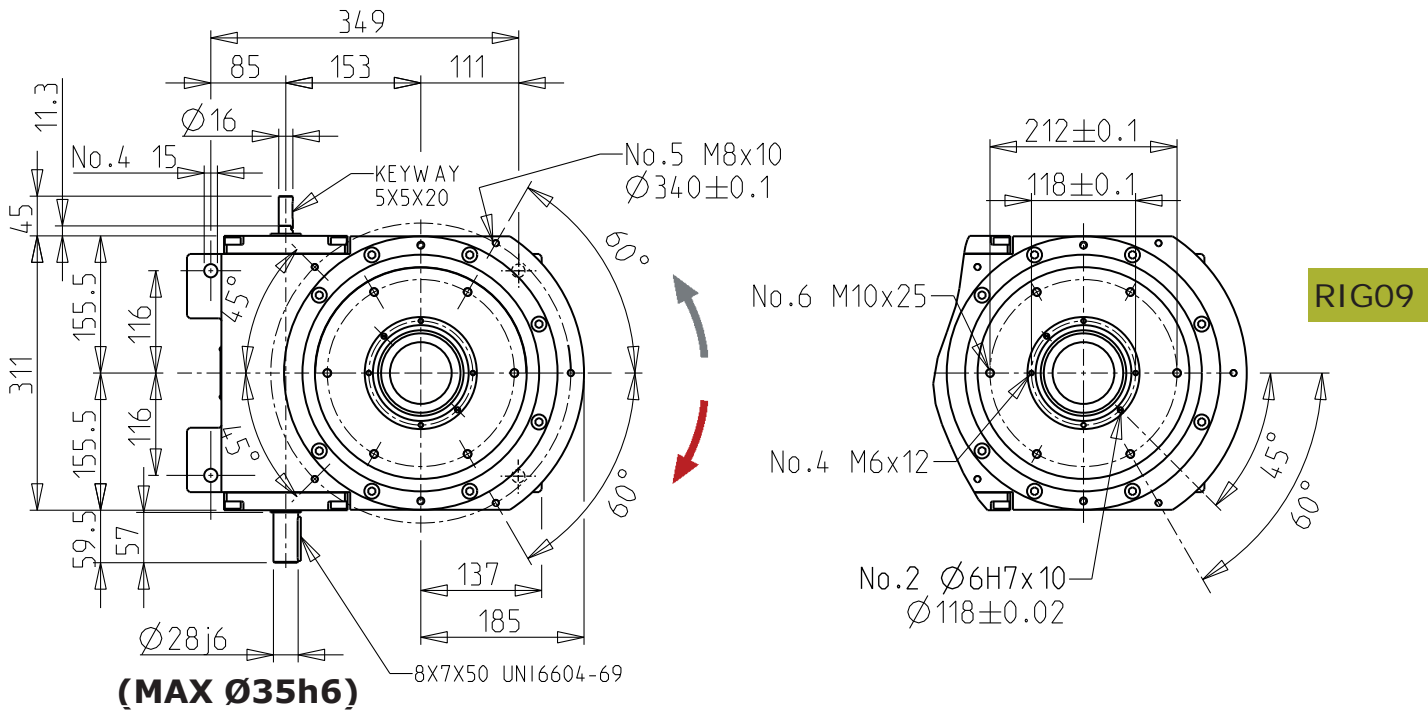
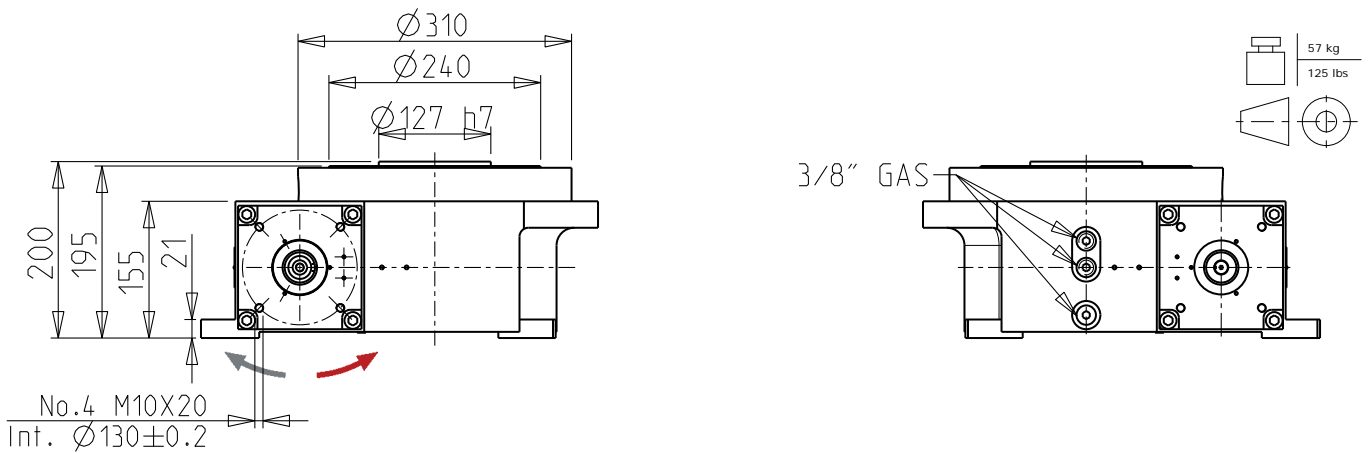


Fig. 22 VS Version.

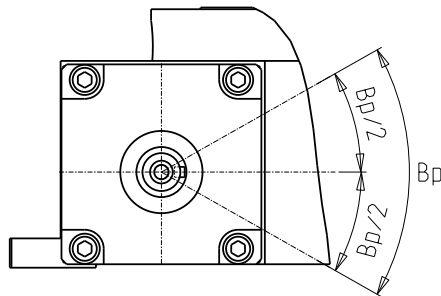


Fig. 23 Cam dwell period.

RIG09	Concentricity		Plate planarity	Division precision			
	Precision	on \varnothing	Precision	Single cycle		Double cycle	
	0.03 mm	127 mm	0.02 mm	$\pm 30''$	± 0.015 mm /100 mm	$\pm 60''$	± 0.03 mm /100 mm



RIG 09 - OPTIONAL CONFIGURATIONS OF THE OUTPUT PLATE

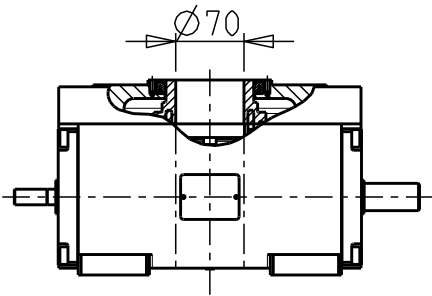


Fig. 24 VCT version.

VCT VERSION

- Central hub with fixed through hole, with no fixing holes.

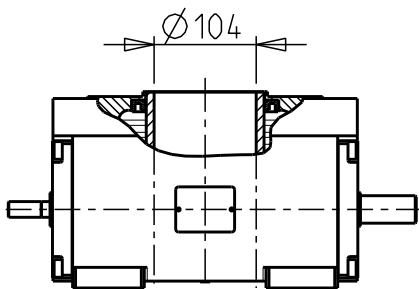
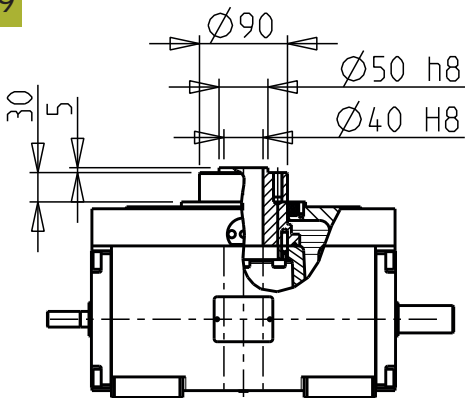


Fig. 25 VCM Version.

VCM VERSION

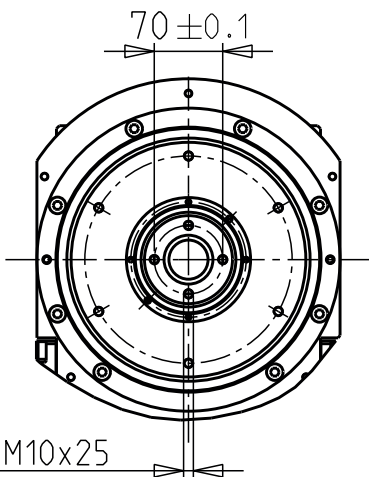
- Large central hub with fixed through hole, with no fixing holes.

RIG09



VCP VERSION

- Fixed central hub with through hole Ø40H8, projection Ø90x30 and fixing holes with centring Ø50h8x5.



No.4 M10x25

Fig. 26 VCP Version.



RIG09 - OPTIONAL CONFIGURATION FOR CEILING OR INVERTED MOUNTING

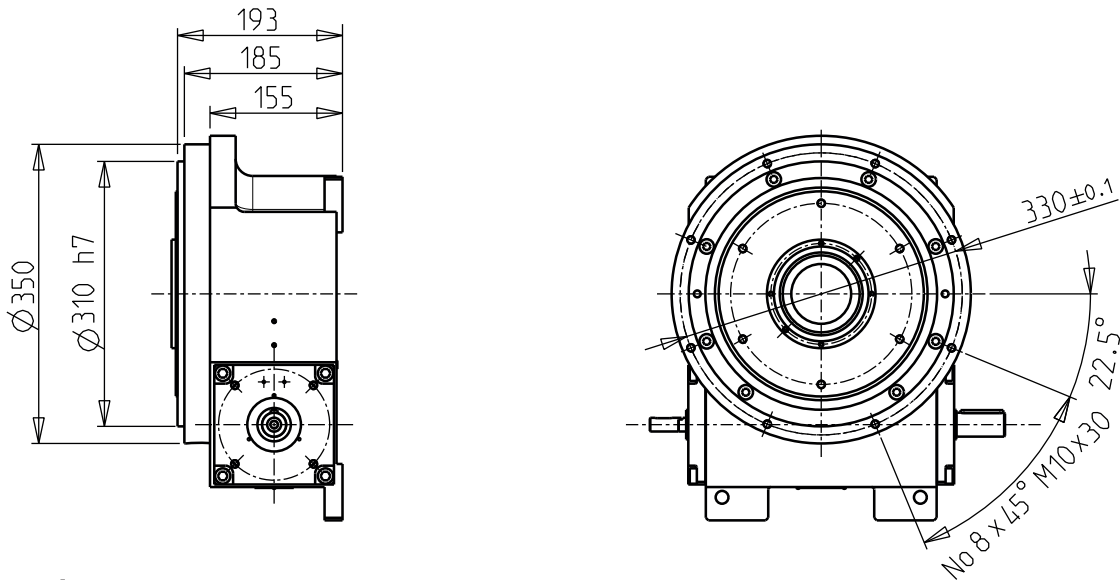
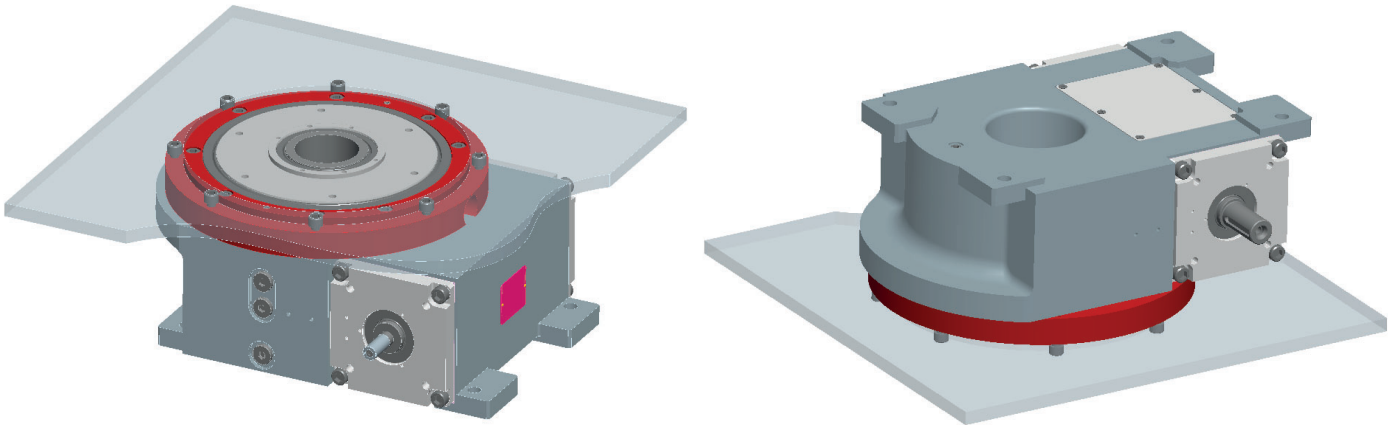
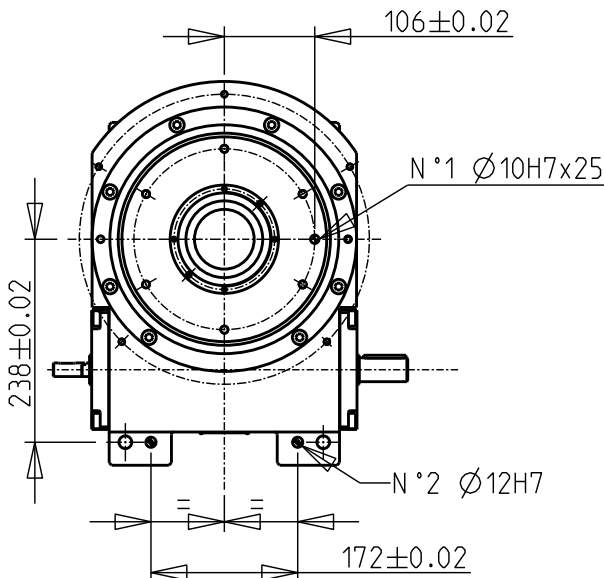


Fig. 27 Configuration for ceiling mounting VC...S.

RIG09

RIG09 - OPTIONAL REFERENCE HOLES



Three dowel holes can be drilled in the output plate and in the table feet, as indicated in Fig. 28. The purpose of the hole in the output plate is to guarantee precise and repeatable assembly of the equipment. The two holes in the feet, on the other hand, allow precise positioning and make the table interchangeable.

Fig. 28 Reference holes.



RIG04 RIG06 RIG09

LOAD CAPACITIES

RIG CODE	No of Stops	Index period B [°]	Dwell period Bp [°]	Static torque St [Nm]	Dynamic torque Mu [Nm]			Velocity Cv	Coefficients			
					50 [Cicl./1']	70 [Cicl./1']	100 [Cicl./1']		Acceler. Ca	Transmission		Kj
RIG04-2-330	2	330	30	128	110	89	72	1.76	5.53	0.54	0.96	
RIG06-2-330				305	297	288	275					
RIG09-2-330				800	566	458	367					
RIG04-3-330	3	330	30	153	107	86	70	1.76	5.53	0.35	0.64	
RIG06-3-330				330	326	321	313					
RIG09-3-330				964	731	596	484					
RIG04-4-310	4	310	50	170	110	89	72	1.76	5.53	0.29	0.51	
RIG06-4-310				346	343	339	333					
RIG09-4-310				1077	942	768	626					
RIG04-5-270	5	270	90	159	108	87	71	1.76	5.53	0.26	0.47	
RIG06-5-270				335	332	328	322					
RIG09-5-270				1006	926	775	616					
RIG04-5-310		310	50	159	100	90	81	1.76	5.53	0.23	0.41	
RIG06-5-310				335	326	316	311					
RIG09-5-310				1006	920	768	610					
RIG04-6-270	6	270	90	173	119	96	78	1.76	5.53	0.22	0.39	
RIG06-6-270				345	342	339	335					
RIG09-6-270				1095	947	773	631					
RIG04-6-310		310	50	173	115	94	76	1.76	5.53	0.19	0.34	
RIG06-6-310				345	334	325	305					
RIG09-6-310				1095	920	750	625					
RIG04-8-270	8	270	90	190	118	95	77	1.76	5.53	0.16	0.29	
RIG06-8-270				356	354	352	348					
RIG09-8-270				1216	1132	924	756					
RIG04-8-310		310	50	190	111	90	74	1.76	5.53	0.14	0.26	
RIG06-8-310				356	340	335	312					
RIG09-8-310				1216	1088	888	727					
RIG04-10-150	10	150	210	167	118	96	78	1.76	5.53	0.24	0.42	
RIG06-10-150				341	336	329	321					
RIG09-10-150				1140	1088	886	721					
RIG04-10-180		180	180	179	120	97	79	1.76	5.53	0.20	0.35	
RIG06-10-180				350	346	342	336					
RIG09-10-180				1142	1111	906	739					
RIG04-10-270		270	90	200	124	101	82	1.76	5.53	0.13	0.23	
RIG06-10-270				361	359	357	355					
RIG09-10-270				1291	1152	941	770					
RIG04-10-310		310	50	200	120	97	79	1.76	5.53	0.11	0.20	
RIG06-10-310				361	345	340	330					
RIG09-10-310				1291	1110	905	740					

Table. 1 Load capacity.



LOAD CAPACITIES

RIG CODE	No of Stops	Index period B° [°]	Dwell period Bp° [°]	Static torque St [Nm]	Dynamic torque Mu [Nm]			Coefficients				
					50 [Cicl./1']	70 [Cicl./1']	100 [Cicl./1']	Velocity Cv	Acceler. Ca	Transmission Kj Kl		
RIG04-12-120	12	120	240	180	121	97	79	1.76	5.53	0.25	0.44	
RIG06-12-120				350	342	332	318					
RIG09-12-120				1145	1110	902	730					
RIG04-12-150		150	210	210	179	121	97	79	1.76	5.53	0.20	0.35
RIG06-12-150					350	346	340	333				
RIG09-12-150					1142	1111	906	738				
RIG04-12-180		180	180	180	190	123	99	80	1.76	5.53	0.16	0.29
RIG06-12-180					356	353	349	344				
RIG09-12-180					1216	1131	923	754				
RIG04-12-270		270	90	90	207	126	101	83	1.76	5.53	0.11	0.20
RIG06-12-270					364	363	361	359				
RIG09-12-270					1339	1164	951	779				
RIG04-12-310	310	50	50	207	130	110	88	1.76	5.53	0.10	0.17	
RIG06-12-310				420	400	380	351					
RIG09-12-310				1339	1250	1120	1000					
RIG04-16-150	16*	150	210	167	123	99	80	1.76	5.53	0.30	0.53	
RIG06-16-150	16			363	359	354	347			0.15	0.26	
RIG09-16-150	1322			1299	1060	864	0.15			0.26		
RIG04-16-180	16*	180	180	164	122	99	80	1.76	5.53	0.25	0.44	
RIG06-16-180	16			362	360	357	353			0.12	0.21	
RIG09-16-180	1309			1296	1058	865	0.12			0.21		
RIG04-16-270	16*	270	90	190	127	103	83	1.76	5.53	0.16	0.29	
RIG06-16-270	16			367	366	365	363			0.08	0.14	
RIG09-16-270	1395			1118	913	748	0.08			0.14		
RIG04-20-180	20*	180	180	179	125	101	82	1.76	5.53	0.20	0.35	
RIG06-20-180				350	347	342	336					
RIG09-20-180				1590	1483	1209	983					
RIG04-20-270	270	90	90	200	129	104	85	1.76	5.53	0.13	0.23	
RIG06-20-270				361	360	358	355					
RIG09-20-270				1600	1538	1256	1027					
RIG04-24-180	24*	180	180	190	147	119	96	1.76	5.53	0.16	0.29	
RIG06-24-180				364	361	357	352					
RIG09-24-180				1600	1510	1232	1003					
RIG04-24-270	270	90	90	207	151	122	99	1.76	5.53	0.11	0.20	
RIG06-24-270				364	359	352	343					
RIG09-24-270				1600	1555	1271	1039					
RIG04-32-180	32**	180	180	164	141	114	92	1.76	5.53	0.12	0.22	
RIG04-32-270		270	90	190	147	119	96			0.08	0.15	
RIG06-32-180	32*	180	180	362	360	357	353	1.76	5.53	0.12	0.22	
RIG09-32-180				1610	1544	1260	1028					
RIG06-32-270		270	90	90	367	366	365	363	1.76	5.53	0.08	0.15
RIG09-32-270					1610	1575	1287	1053				

(*) One complete turn of the input shaft produces two complete cycles (indexing/dwell) at the output.

(**) One complete turn of the input shaft produces four complete cycles (indexing/dwell) at the output.

Table. 1 Load capacity.



LOAD CAPACITY OF THE OUTPUT BEARING

The load capacities indicated in the table and represented in the graphs below refer to the table mounted in position V5 and represent the maximum values for each type of load applied individually. The capacity to withstand combined loads must be evaluated using the diagrams shown in Fig. 30.

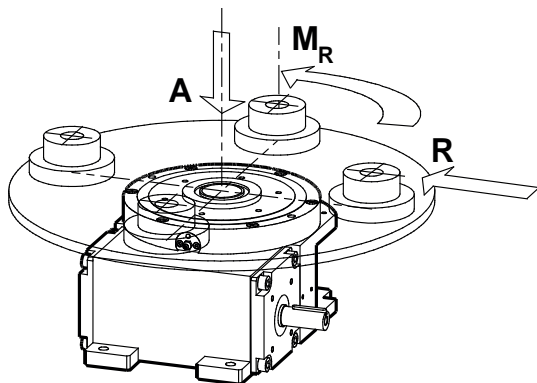


Fig. 29 Loads diagram.

SERIES	STATIC LOAD CAPACITIES		
	AXIAL A [N]	RADIAL R [N]	TILTING Mr [Nm]
RIG04	5410	2140	326
RIG06	7070	2810	625
RIG09	10190	4040	1230

Tab. 2 Load capacities.

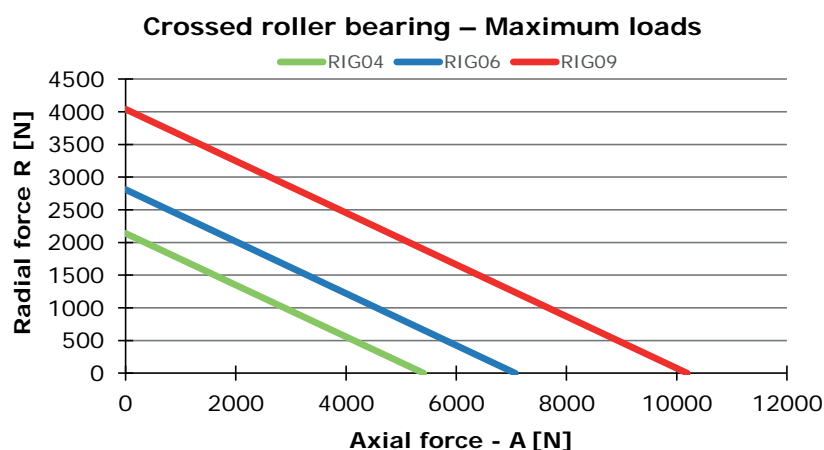
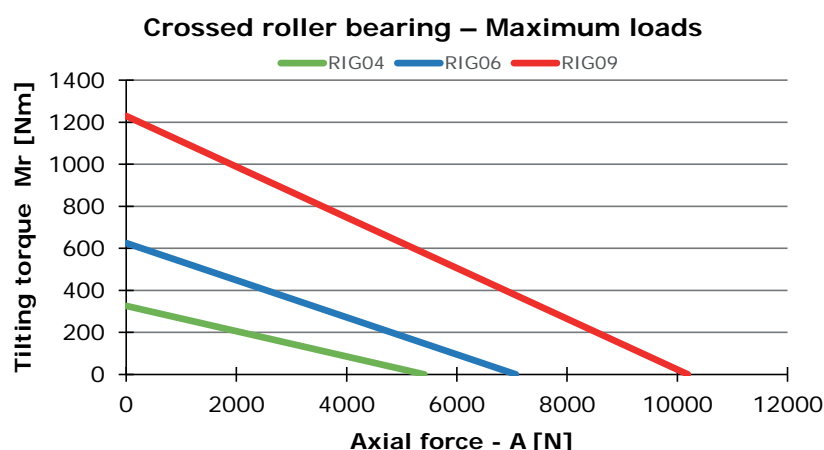


Fig. 30 Static load capacities.

LUBRIFICAZIONE

Lubrication of the tables is the long-life type using ISO VG150 mineral oil. RIGIDIAL tables are delivered already filled with the required quantity of lubricant. For mountings in position V5, the output plate bearing is already lubricated during assembly, so no additional lubrication is required. Lubrication of the reducers, reduction gears, speed variators, etc., is independent and must be carried out according to the instructions provided by the manufacturers of single products.



TABLE MOUNTING POSITIONS

The table can be mounted in all positions, since it is equipped with long-life lubrication and supplied with the right quantity of oil.

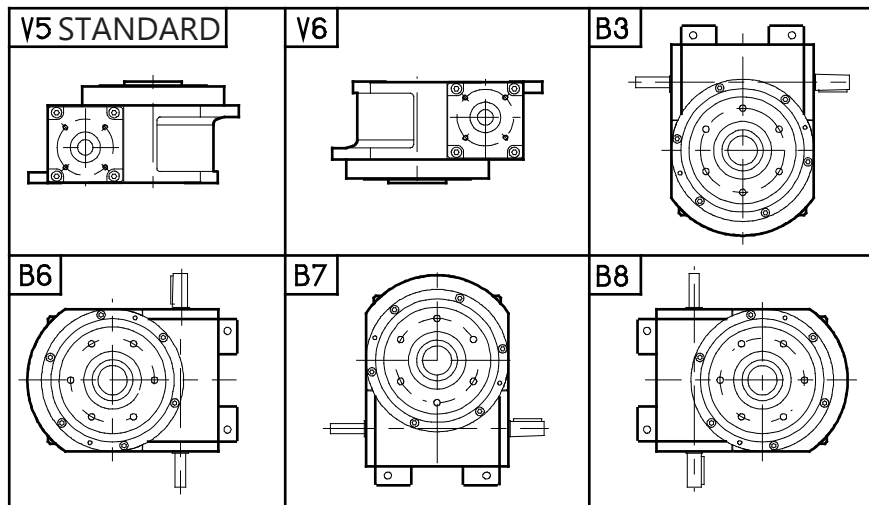


Fig. 31 Table mounting positions.

Unless specified otherwise, the RIGIDIAL tables are supplied for the standard V5 mounting position.

INPUT SHAFT PROJECTION

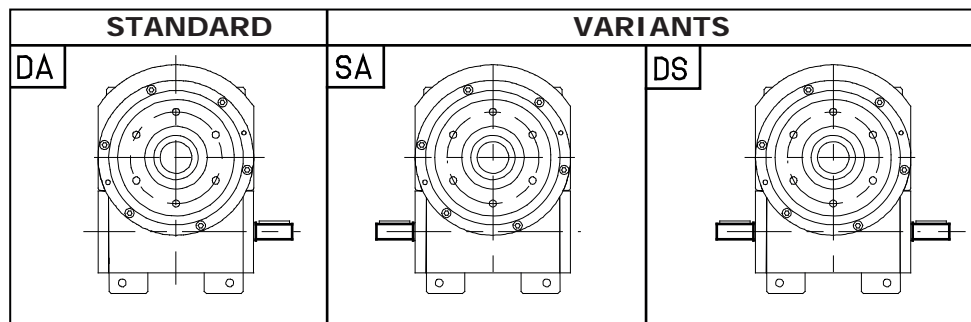


Fig. 32 Input shaft projections.

Unless specified otherwise, the RIGIDIAL tables are supplied with the input shaft projection in position **DA**.

PRESETTINGS OF WORM REDUCTION GEARS - MOTORS

TYPE	POSSIBLE COMBINATIONS			CHARACTERISTICS OF REDUCTION GEARS WITH INPUT AT 1400 [rpm] 4-pole MOTORS, n = 1400 rpm									
	RIG04	RIG06	RIG09	Ratio	i	7:1	10:1	15:1	20:1	28:1	40:1	49:1	56:1
				Output	rpm	200	140	93.3	70	50	35	28.6	25
RMI28/F1 LCB PAM B14	●			Power	[kW]	0.18	0.18	0.18	0.13	0.13	0.09	0.04	0.04
				Output M2	[Nm]	7.2	9.9	14	12	16	14	7.1	7.8
RMI40/F1 LCB PAM B14	●	●		Power	[kW]	0.37	0.37	0.37	0.37	0.25	0.18	0.18	0.13
	STAND.			Output M2	[Nm]	15	21	30	38	33	30	35	28
RMI50/F1 LCB PAM B14		●		Power	[kW]	0.75	0.75	0.75	0.55	0.55	0.37	0.25	0.25
		STAND.		Output M2	[Nm]	30	42	61	56	70	61	44	50
RMI70/F3 LCB PAM B14			●	Power	[kW]	1.5	1.5	1.5	1.1	1.1	0.75	0.55	0.55
				Output M2	[Nm]	62	88	126	120	153	141	121	134
RMI85/F3 LCB PAM B14			●	Power	[kW]	2.2	2.2	2.2	2.2	1.5	1.1	1.1	1.1
			STAND.	Output M2	[Nm]	92	128	187	243	212	210	246	282

Tab. 3 Presettings of the reduction.



USE OF THE INPUT TORQUE LIMITER

The worm reduction gears mounted on RIGIDIAL tables are equipped with a built-in clutch torque limiter. The limiter release torque is calibrated by means of a nut on the outside of the slow shaft of the reduction gear. The torque limiter reduces the risk of breaking of the RIGIDIAL table or of the reduction gear in case of accidental overloads occurring during the rotation, caused by emergency stops, voltage drops, accidental seizing or collisions. The limiter must be calibrated in such a way as to make it possible to ensure a perfectly rigid motion transmission under standard operating condition, with no slipping of the clutch. However, the calibrating torque must be lower than the maximum torques which the RIGIDIAL table and the worm screw reduction gear are capable of transmitting.

Unless specified otherwise, the limiter is calibrated at the highest allowed torque.

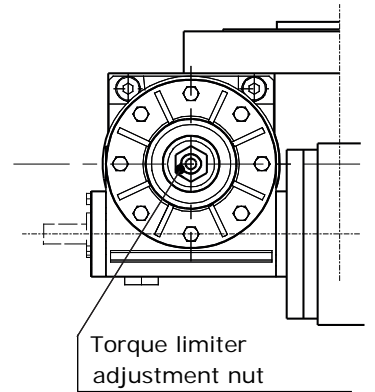


Fig. 33 Adjustment nut.



CAUTION: Please remember that the torque limiter is not a safety device.

MOUNTING POSITIONS OF THE REDUCTION GEARS

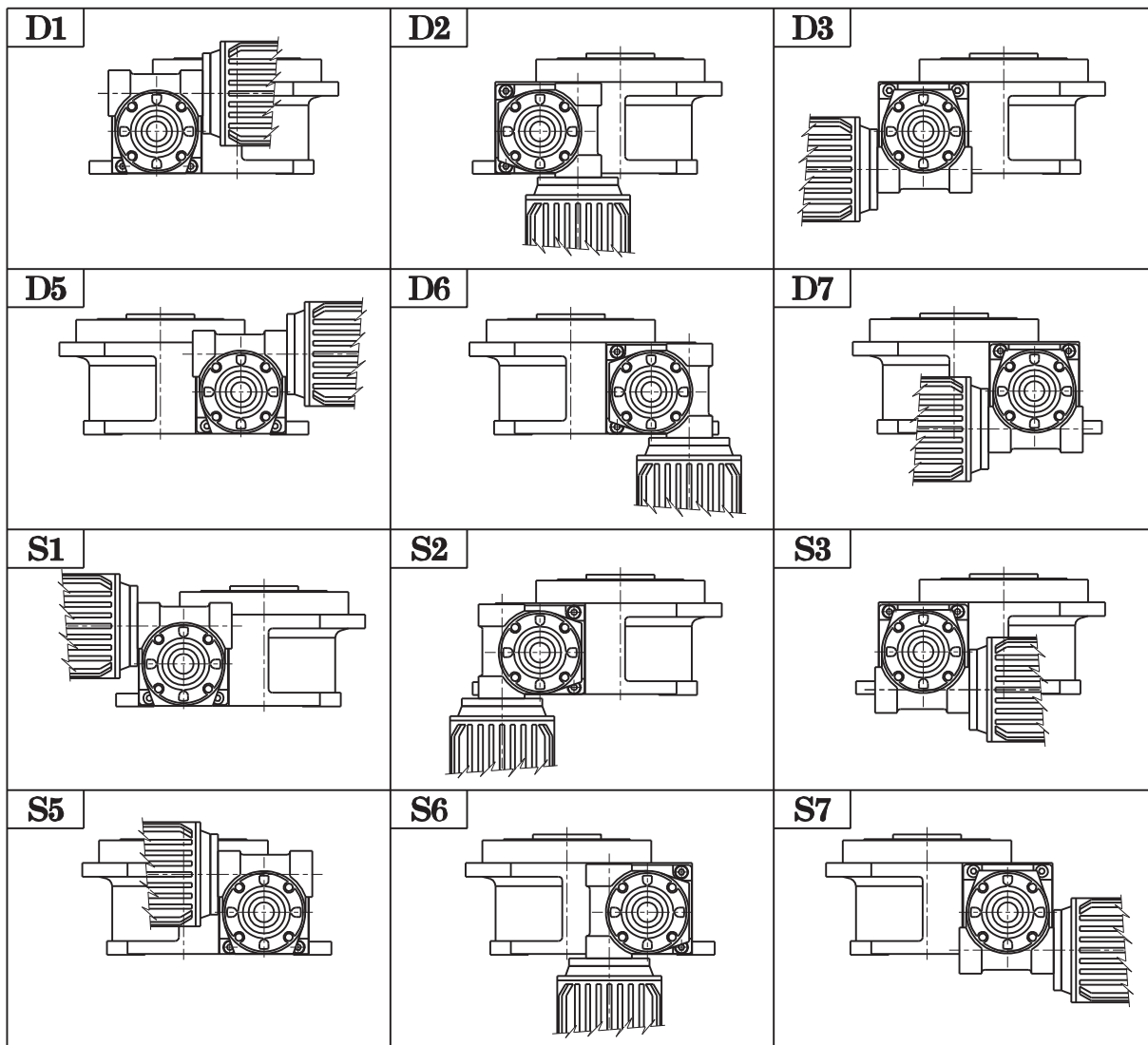


Fig. 34 Reduction gear mounting positions.



E-CAM CONTROL SYSTEM

E-CAM

The E-CAM Motor Management System is a high-integrated solution for an easy management of the rotation and stop of the motor recognising the position of the cam (indexing, mechanical dwell, safety dwell).

The E-Cam system is available in 4 different configurations:

Electronic phase cam E-Cam HCS

The electronic phase cam permits an easy management of the signals used to start/stop the electrical motor. The E-CAM:

- Optimise the cycle time of the indexer and improve the lifetime.
- Shows the current status of the system.
- Can be easily tuned.
- Permits an accurate motor stop.
- Is easily connected with the other peripherals.

Solid State Relay switch E-relay HCS

The Solid State Relay Switch E-relay HCS enables the E-CAM to control the start/stop of the asynchronous motor (max power 4kW).

The Solid State Relay Switch E-relay HCS:

- Simplifies the control of the induction motor.
- Minimises the PLC software to control the motor start/stop.



The Solid State Relay Switch E-RELAIS HCS does not guarantee a safe re-start for the motor after an E-stop. For safe management after E-stops a VFD/inverter is recommended.

E-Cam con E-inverter HCS

For safe and easy management of E-stops, the E-CAM can be used with the E-INVERTER:

- Safely manages the re-start of the motor after an E-stop.
- Parameters pre programmed at the factory.
- Simplifies the motor management.
- Interacts with the user through the E-DISPLAY in order to manage the motor speed and the acceleration/deceleration time.

When an E-stop occurs the E-INVERTER stops the motor using the deceleration time parameter imposed by the user and restarts from an E-stop with a lower speed until the indexer reaches the Security dwell cam phase, then the indexer is re-started at the operating speed.

E-Cam inverter-compatibility .

The E-Cam system can be easily connected to all VFD/INVERTER available on the market, obtaining the same performances described in the previous section. In this case the VFD/INVERTER parameters must be programmed by the customer.



MIB PHASE MICRO ASSEMBLY

PROXIMITY SENSOR & PHASE CAMS OPERATION

- The signal to stop the motor is made by way of two phase cams A & B and two proximity sensors (PNP n.o.) designated as SA and SB (Fig. 36).
- Phase cam A is fixed on the input shaft of the indexer by means of a key and has a rounded cut-out in the diameter designated as DW. This cut-out corresponds to the dwell period of the indexer.
- When the output signal of sensor SA (corresponding to phase cam A) is low, the unit is positioned in dwell DW.
- The second phase cam, noted as phase cam B is adjustable: the gap DS must be adjusted by rotating the timing bands C to be the same width or wider than the rounded cut-out in phase cam A (DW).
- Phase cam B must be used to provide a signal to stop the motor. The adjustable timing bands C of phase cam B allow the sensor SB to detect the dwell position in advance of proximity sensor SA, thereby providing a signal to indicate the indexer is in dwell.
- Diagrams 1 and 2 show the timing sequence and operation.
- When the output signal of sensor SB goes low the motor must be decelerated (Diag. 1 - Pos. 1).
- The motor speed decrease (Diag. 1 - Pos. 2) and comes to a stop (Diag. 1 - Pos. 3) in the dwell period (DW).
- When the motor has stopped, the output of sensor SA must be low (Diag. 1 - Pos. 4) otherwise the unit has not properly stopped in the dwell phase position (Diag. 2 - Pos. 3). If this happens, the timing bands C of phase cam B must be adjusted (make gap wider) as shown in Fig. 37 so that the stop signal is detected earlier and again check that the motor is decelerated quickly enough so that it stops in the dwell period. The proximity sensor SA will show a low signal when the motor has stopped.
- It is important that the motor speed be managed via a controlled deceleration to stop and not coast to a stop.

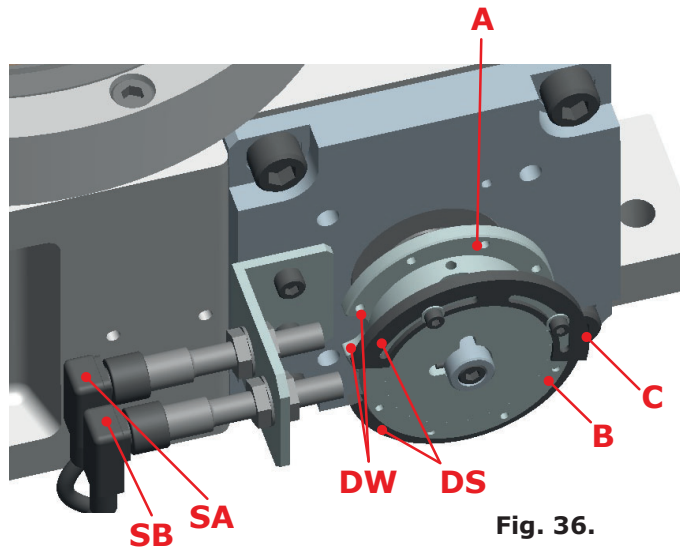


Fig. 36.

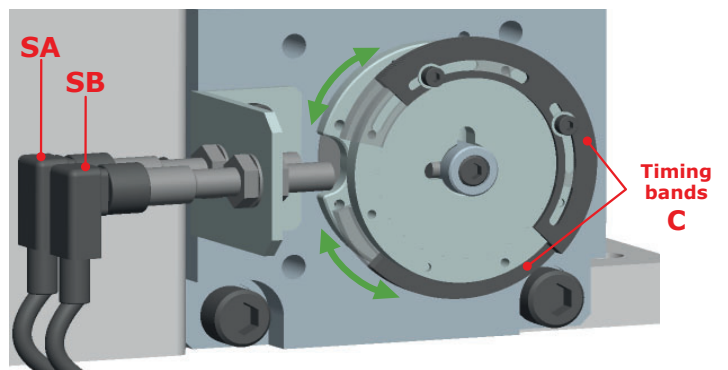


Fig. 37.

MIB phase cam for single cycle movements. (One pair of timing bands).

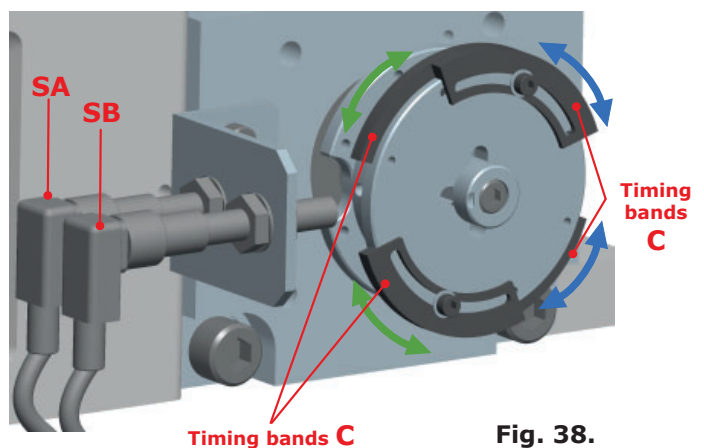


Fig. 38.

MIB phase cam for double cycle movements. (two pairs of timing bands).



PHASING OF MICRO ASSEMBLY FOR INDEXING TABLES

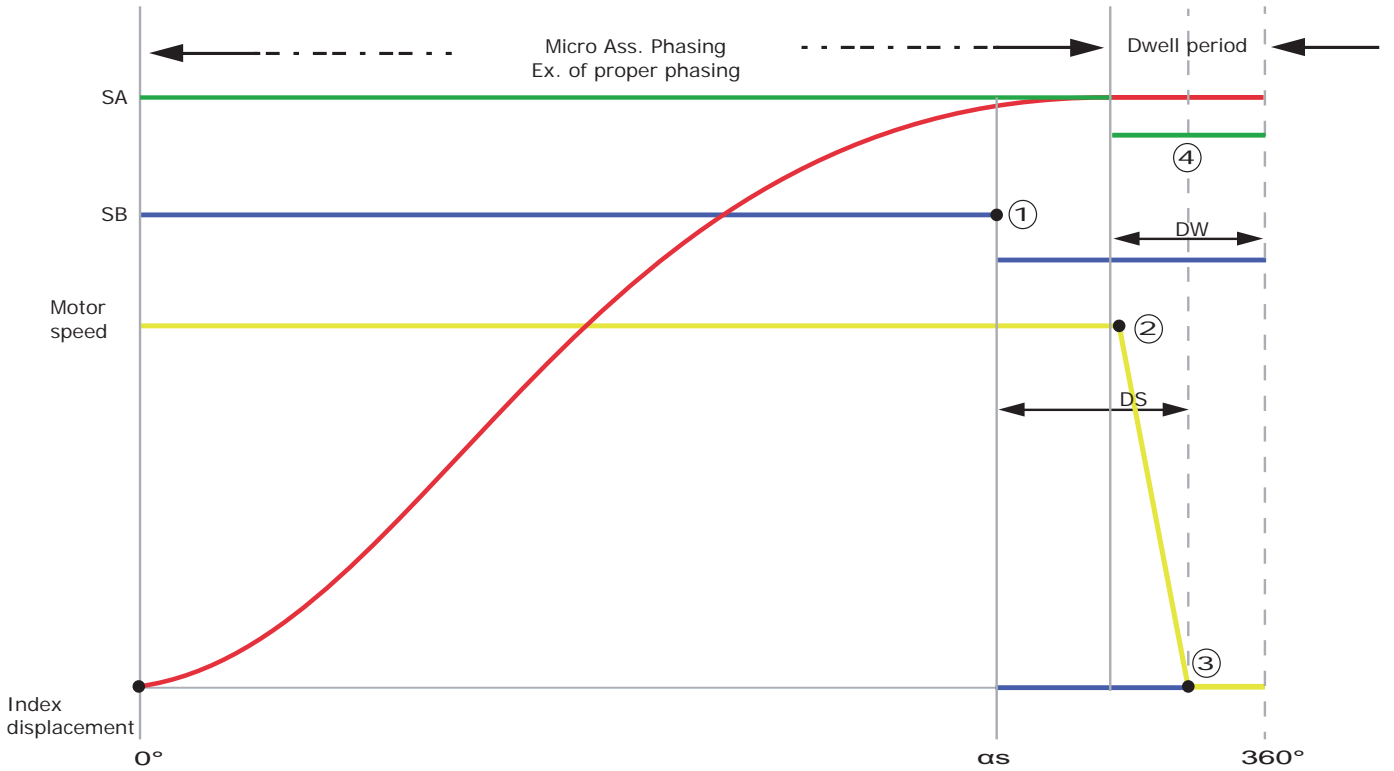


Diagram 1 - Motor stopped correctly in the dwell section

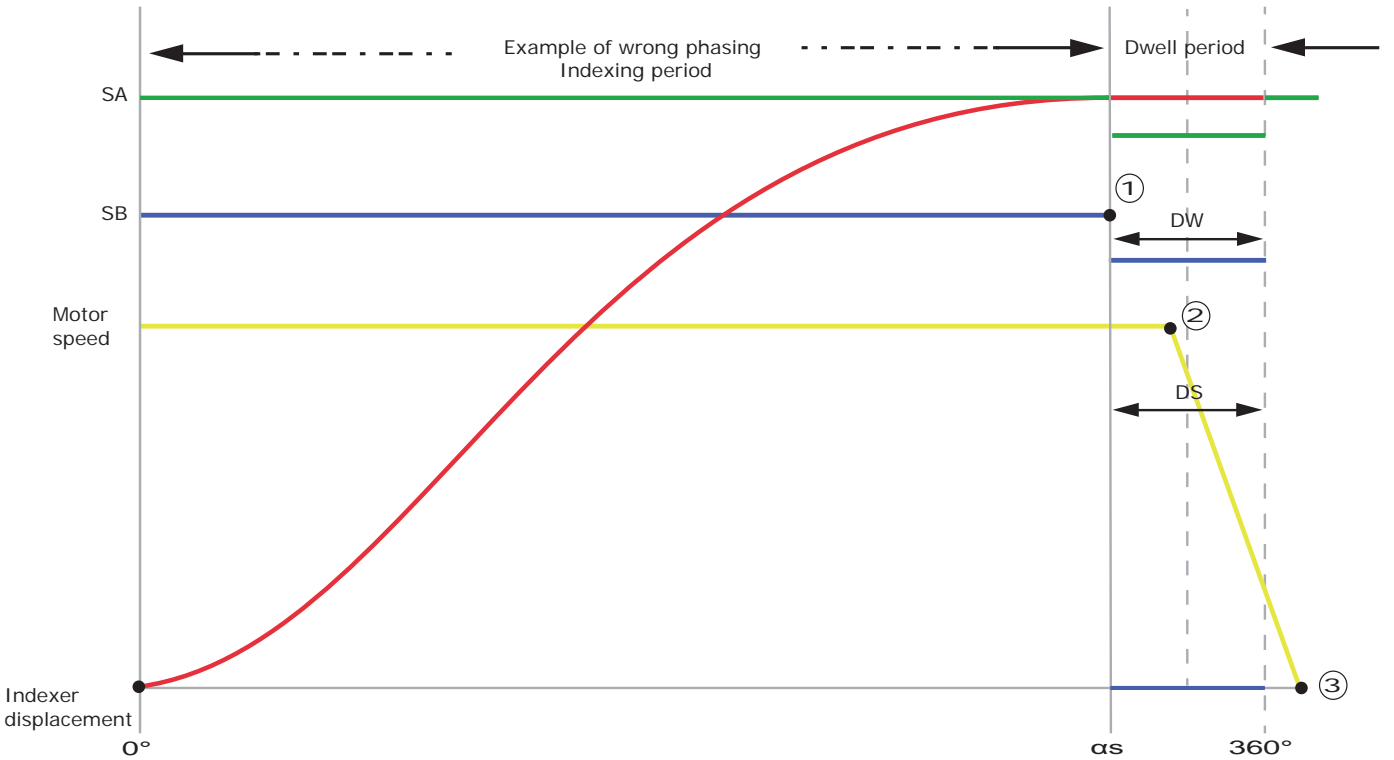


Diagram 2 - Motor incorrectly stopped in the dwell section



CAM-PHASE MICRO ASSEMBLY AND E-CAM CONTROL SYSTEM

The cam-micro assembly stops the table during the mechanical dwell period, with the consequent prolonging of the table dwell period.

During the mechanical dwell period, the table can be restarted in oscillating mode, by reversing the direction of rotation of the motor and thus of the output plate.

All tables can be equipped regardless with the E-CAM control system or the MIB phase micro assembly, except for tables RIG04 with a 32-station cam.

These tables can fit the E-CAM system but not the MIB micro assembly, which is replaced by the CM4 micro assembly.

The CM4 micro assembly fits a 4-tip cam combined with an inductive sensor type PNP. n.o. (Fig. 39).

The footprint of the CM4 micro assembly is the same as the MIB assembly.

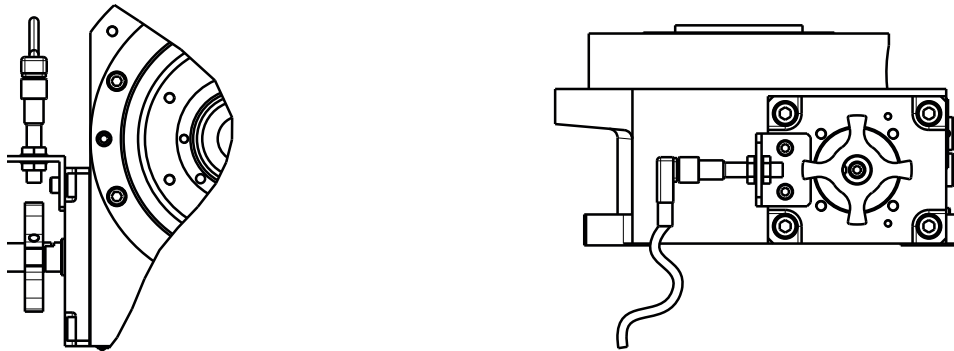


Fig. 39 CM4 Micro Assembly.

Adjustment of the micro assembly and of the E-CAM control system

The adjustment and phasing jobs of the MIB and CM4 micro assemblies are always the user's responsibility, and must be carried out during table installation.

The adjustment and phasing of the E-CAM system, on the other hand, is carried out at the factory, by setting standard parameters.

The user is responsible for verifying and, if necessary, conducting a new calibration before the unit is commissioned.

The connection and management of the micro or E-CAM assemblies to the control system is the user's responsibility.



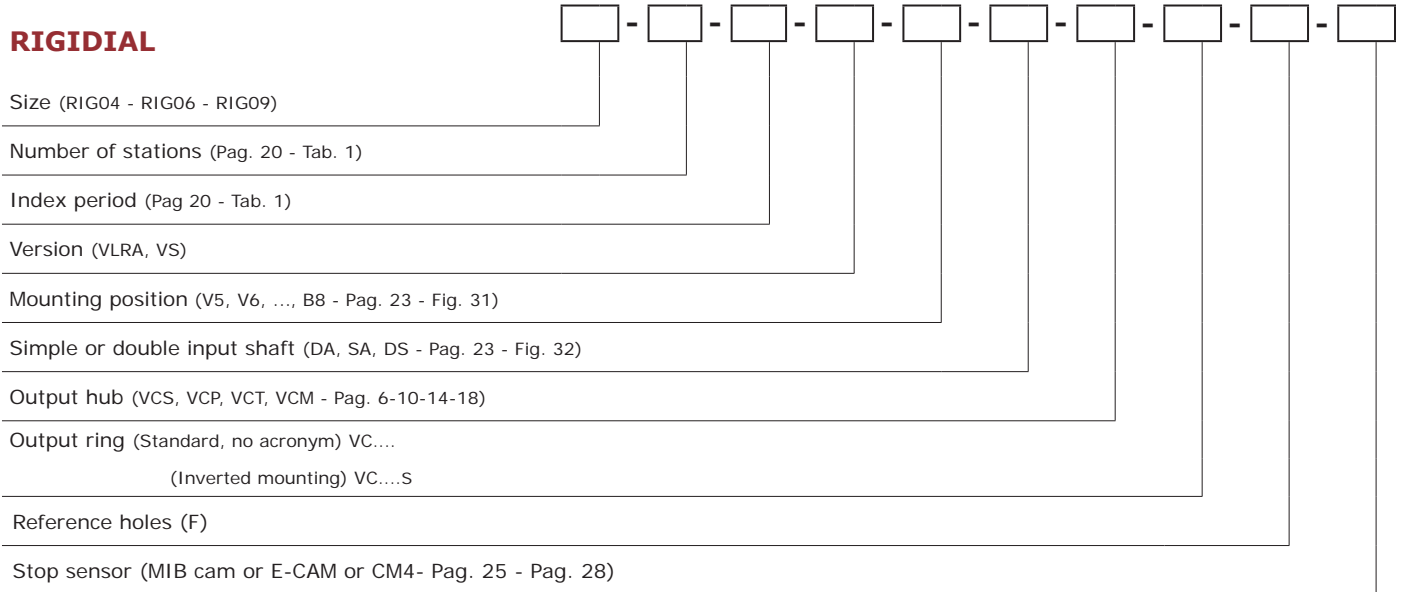
CAUTION: Please remember that the micro assembly is not a safety device.



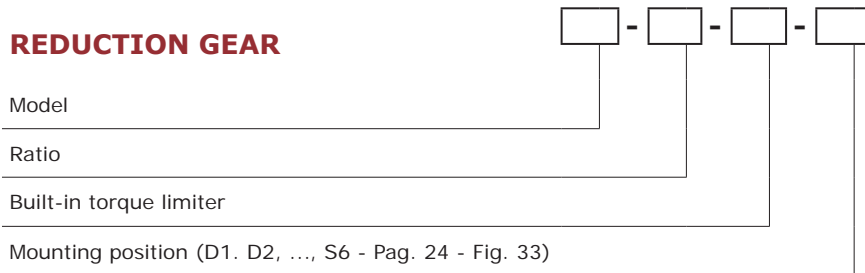
ORDERING CODES

The ordering code of the RIGIDIAL tables is created by following an alphanumeric classification and formed according to the diagram provided here below.
When placing an order, please refer to this diagram in order to avoid mistakes and misunderstandings

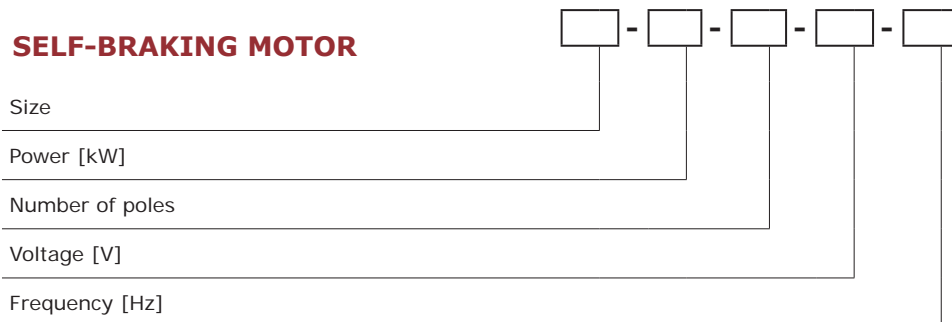
RIGIDIAL



REDUCTION GEAR



SELF-BRAKING MOTOR



Describe clearly any additional features required.

Coding example:

RIG06 indexing table with 4 stations, indexing period of 310°, mounted in position V5 and with single input shaft on the right side. Output version VCS, ring for upside down mounting and reference holes.

VLRA standard motorised version with reduction gear RMI50, reduction ratio 1/28, LCB clutch torque limiter, reduction gear position S3 and self-braking motor size 80, 0.75 kW, flange B14, voltage 230/400[V] a 50/60 Hz.

RIG06 - 4 - 310 - VLRA - V5 - DA - VCSSF - MIB

REDUCTION GEAR STM RMI 50 F1 - 1:28 - PAM 80B14 - S3 - LCB

SELF-BRAKING MOTOR 80b/B14 - 0.75[kW] - 4 P- 230/400 [V]- 50/60 [Hz]

[to create]

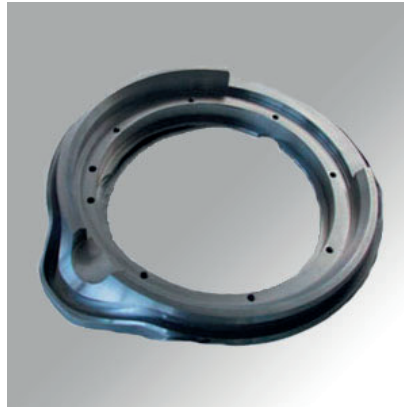
in movement with the times

Products

Cam Mechanisms and special products



Compact double spherical cam mechanism for mechanical automation



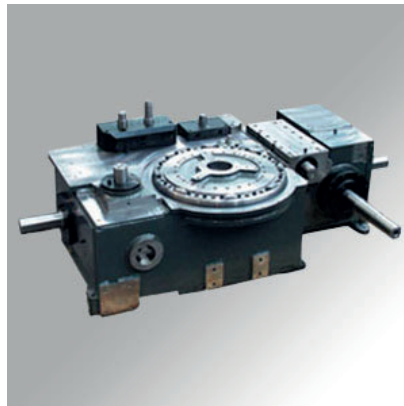
Combination of flat cam and globoidal profiled cam



Barrell shaped cam



Globoidal cam mechanism with four synchronized intermittent movements. Bilateral outputs.



Mechanism with different cams producing seven intermittent and oscillating movements in output



Parallel shaft mechanism with flat cam



Flat cam with conjugate profiles

... the culture of precision