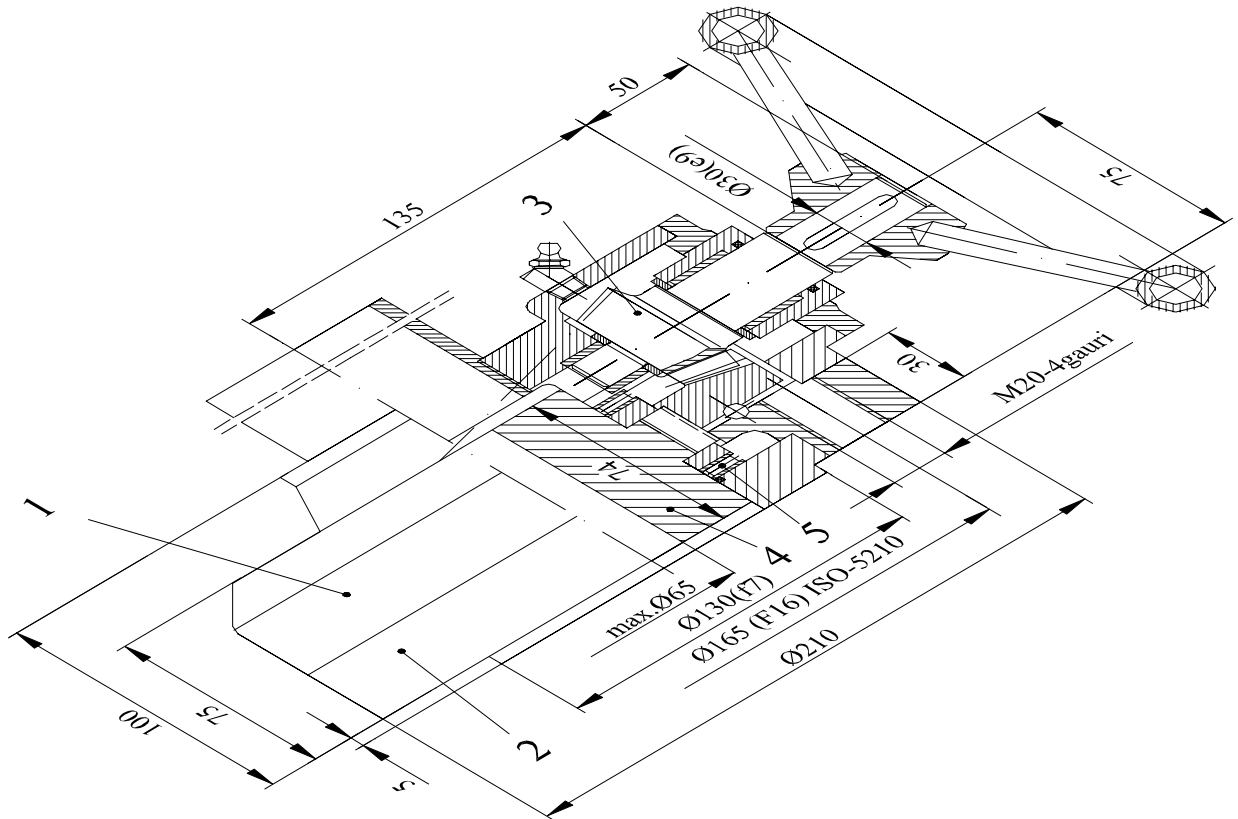


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# MANUAL ACTUATORS FOR INDUSTRIAL VALVES

## ACTIONARI MANUALE PENTRU ARMATURI INDUSTRIALE



49/2005.rev.2

## **1. GENERALITATI**

In acest catalog sunt prezentate toate tipurile de actionari manuale aflate in fabricatia S.C. NEPTUN S.A. Campina destinate antrenarii robinetilor industriali. Aceste actionari trebuie folosite atunci cind momentele de actionare necesare nu pot fi satisfacute cu roti de mana de diametru rezonabil montate direct pe robinet.

Neptun S.A. fabrica urmatoarele tipuri de actionari:

### **1.1. Actionari manuale „Multi-Tura” care sunt:**

- reductoare manuale conice tip RK
- reductoare manuale cilindro-conice tip 2CK, cu demultiplicare cilindrica la intrare pentru reducerea momentului de intrare necesar.
- reductoare manuale cilindrice tip ICR
- roti de mana (sudate sau turnate- vezi anexele).

### **1.2. Actionari manuale „Sfert de tura” care sunt:**

- reductoare manuale melcate tip AM
- reductoare manuale cilindro- melcate tip R2CM, cu demultiplicare cilindrica la intrare, pentru reducerea momentului de intrare necesar.
- reductoare manuale melcate debraiabile tip RMD, prevazute cu posibilitatea decuplarii arborelui de intrare.
- reductoare manuale surub- piulita articulata tip AV.
- chei de actionare tip CAM.

## **2. CONDITII DE UTILIZARE A ACTIONARILOR MANUALE**

Actionarile manuale pentru robineti industriale pot fi utilizate in urmatoarele conditii:

- standard: -33°C...+45°C
- la cerere: -40°C...+40°C.

## **3. CARACTERISTICI CONSTRUCTIVE**

### **3.1. Angrenaje**

#### **3.1.1. Reductoarele manuale „Multi-Tura” cuprinde:**

- angrenaje cilindrice facute din otel de imbunatatire- la reductoarele ICR si la reductoarele cilindrice de demultiplicare
- un angrenaj conic facut din otel de imbunatatire- la reductoarele RK si 2CK.

## **1. GENERALITIES**

This catalogue shows all the types of manual actuators for industrial valves currently made at NEPTUN S.A. Campina. Those actuators are likely to be used whenever the necessary driving torque can not be achieved using a handwheel of reasonable diameter, placed directly onto the valve head. NEPTUN S.A. is currently producing the following types of manual actuators:

### **1.1. „Multi- Turn” manual actuators featuring:**

- RK manual bevel actuators
- 2CK manual cylindrical- bevel actuators with a cylindrical input demultiplication, to decrease the necessary input torque
- ICR manual cylindrical actuators
- welded or cast handwheels- see appendices.

### **1.2. „Quarter- Turn” manual actuators featuring:**

- AM manual worm actuators
- R2CM manual cylindrical-bevel actuators with a cylindrical input demultiplication, to decrease the necessary input torque
- RMD declutchable worm actuators, provided with the facility of disengaging the input shaft, having a coupling between the worm quadrant and the output shaft.
- AV travelling- nut manual actuators
- CAM lockable manual lever.

## **2. CONDITIONS FOR USING THE MANUAL ACTUATORS**

The manual actuators for industrial valves can be used in the following conditions:

- standard: -33°C...+45°C
- by request: -40°C...+40°C.

## **3. CONSTRUCTIVE FEATURES**

### **3.1. Gears**

#### **3.1.1. „Multi-Turn” manual actuators include:**

- cylindrical gears made of heat treatable steel at ICR actuators and at the cylindrical demultiplication gearboxes
- a bevel gear made of treatable steel- at RK and ICR gearboxes.

### **3.1.2. Reductoare manuale „Sfert de Tura” cuprind:**

- un angrenaj melc- sector melcat la reductoarele tip AM,R2CM si RMD
- o transmisie surub- piulita articulata la reductoarele tip AV
- melcii si arborii melcati de la reductoarele AM si RMD se executa din:
  - otel de imbunatatire- AM0...4 si RMD
  - otel de cementare- AM5...R2CM
  - sectoarele melcate se executa din fonta cu grafit nodular: Fgn 400-12 (GGG 40-echivalent DIN)
  - suruburile de antrenare si bucsa de iesire de la reductoarele AV se executa din otel carbon: OLC 45.
  - piulitele de la reductoarele AV se executa din fonta cu grafit nodular Fgn 400-12 (GGG- 40).

### **3.2. Carcase**

#### **3.2.1. Actionari „Multi- Tura”**

Carcasele se executa din:

- otel turnat- reductoare RK si 2CK
- fonta- reductoare ICR.

#### **3.2.2. Actionari „Sfert de Tura”**

- Carcasele se executa din aluminiu turnat sub presiune pentru AM0P, AM1P, AM1.5P,AM2P si fonta pentru restul marimilor.
- Cheile de actionare manuala se executa din aluminiu turnat sub presiune sau fonta.

### **3.3. Piulite si bucsa de antrenare**

- Piulitele si bucsile de antrenare se executa din bronz sau fonta cu grafit nodular.

### **3.4. Lagare**

#### **3.4.1. Actionari „Multi- Turna”**

- Lagarele radiale sunt bucsa din metal sinterizat sau alama.
- Coroana conica e lagaruita pe bile de rulment.
- Piulita de antrenare e lagaruita pe rulmenti axiali cu ace.

#### **3.4.2. Actionari „Multi- Turna”**

- Lagarele radiale sunt bucsa din metal sinterizat sau alama.
- Melcul e lagaruit axial pe saibe antifriciune la AM0P, AM1P, AM1.5P, AM2P si rulmenti axiali cu ace sau cu bile la celelalte marimi.

### **3.1.2. „Quarter- Turn” manual actuators include:**

- a worm gear composed of a worm and a worm quadrant, at the gearboxes AM, R2CM and RMD.
- a transmission including a screw and an articulated nut, the gearboxes AV.
- the worms and the worm shafts of the gearboxes AM and RMD are made of:
  - heat treatable steel- AM0...4 and RMD
  - case hardening steel- AM5...10
  - the quadrants are made of ductile iron Fgn 400-12 (GGG 40- DIN equivalent)
  - the driving screws and the output bush at the AV actuators are made of carbon steel C45.
  - the nuts at the AV actuators are made of ductile iron GGG 40.

### **3.2. Housings**

#### **3.2.1. „Multi- Turn” actuators**

The housings are made of:

- cast steel- RK and 2CK
- cast iron- ICR.

#### **3.2.2. „Quarter- Turn” actuators**

- The housings are made of pressure cast aluminium for AM0P, AM1P, AM1.5P,AM2P, and cast iron for the other sizes.
- The lockable manual levers are made of pressure- cast aluminium or cast iron.

### **3.3. Driving nuts and bushes**

- The driving nuts and bushes are made of bronze or ductile iron.

### **3.4. Bearings**

#### **3.4.1. „Multi- Turn” actuators**

- The radial bearings are sleeves made of sintered metal or brass.
- The driving bush is axially supported onto axial needle bearings.
- The driving bush is axially supported onto axial needle bearings.

#### **3.4.2. „Quarter- Turn” actuators**

- The radial bearings are sleeves made of sintered metal or brass.
- The worm is axially supported onto antifricion, washers at AM0P,AM1P, AM1.5P, AM2P, and axial needle or ball bearings at the other size.

#### 4. UNGERE

Ugerea se face cu unsoare consistenta UM 185 Li 2EP.

#### 5. PRINDERE

##### 5.1. Actionari „Multi- Tura”

Flansa de prindere pe armatura este conform ISO 5210.

##### 5.2. Actionari „Sfert de Tura”

Flansa de prindere pe armatura este conform ISO 5211.

5.3. Alte prinderi pot fi executate la cerere.

#### 6. MOTORIZARE

Reductoarele manuale se executa si in varianta E cu intrare flansata pentru motorizare.

Actionare manuala se face cu roti de mana in conditiile realizarii unui moment la intrare de max. 225 Nm si a unei forte tangente de max. 350 N. Alegerea diametrului rotii de mana se face pentru momentul de intrare impus din graficul de mai jos.

In cazul in care momentul necesar la intrarea in reductor este mai mare de 225 Nm se impune utilizarea unui demultiplicator ca la tipurile 2CK si R2CM sau actionare cu mecanism ca in variantele **E**.

#### 4. LUBRICATION

Lubrication is done with grease UM 175 Li Ca Pb2.

#### 5. OUTPUT FLANGES

##### 5.1. „Multi- Turn” actuators

Output flanges according to ISO 5210.

##### 5.2. „Quarter- Turn”

Output flanges according to ISO 5211.

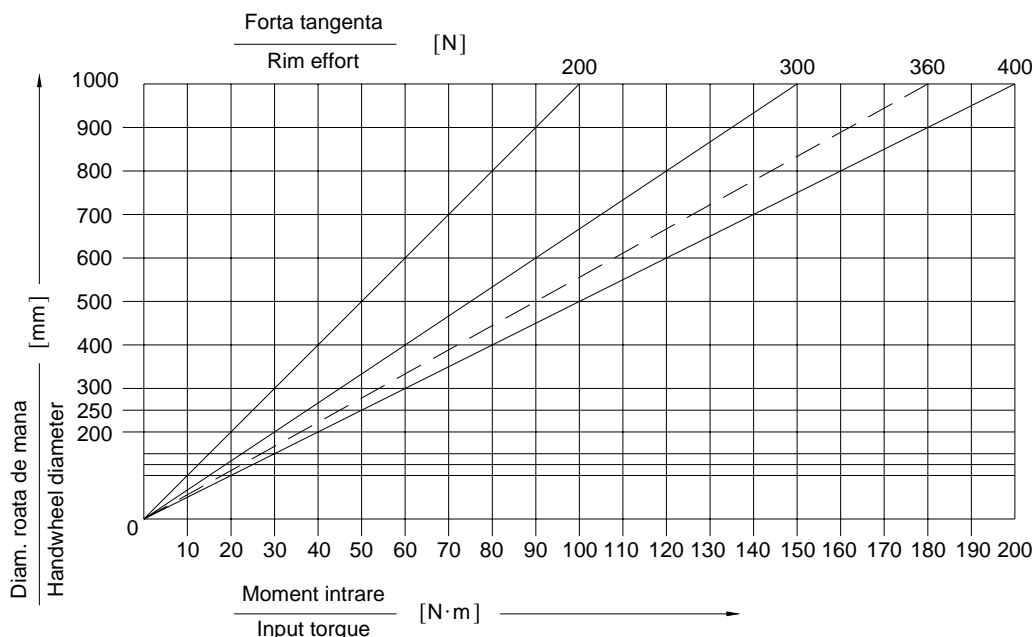
5.3. Other output flanges available by request.

#### 6. MOTORISATION

The manual actuators can be made in E variant with input flange for motorisation.

The manual driving is likely to be done with handwheels provided the input torque necessary is less than 225Nm and the rim effort is under 350N. Whenever the input torque is imposed, the handwheel diameter will be selected from the graph below.

In case the input torque at a gearbox is bigger than 225Nm, it is recommended to use a demultiplication at the types 2CK and R2CM or a motorisation (**E** variant).



#### Mod de utilizare

1. Luati momentul de intrare din catalog.
2. Stabiliti forta tangenta maxima admisibila.
3. Alegeti diametrul rotii.

#### How to use

1. Get the input torque from the catalogue.
2. Set max. allowable rim effort (swtandard is 360N).
3. Select handwheel diameter

# Manual actuator catalogue – List of components

## Lista componenta catalog reductoare manuale

rev.2

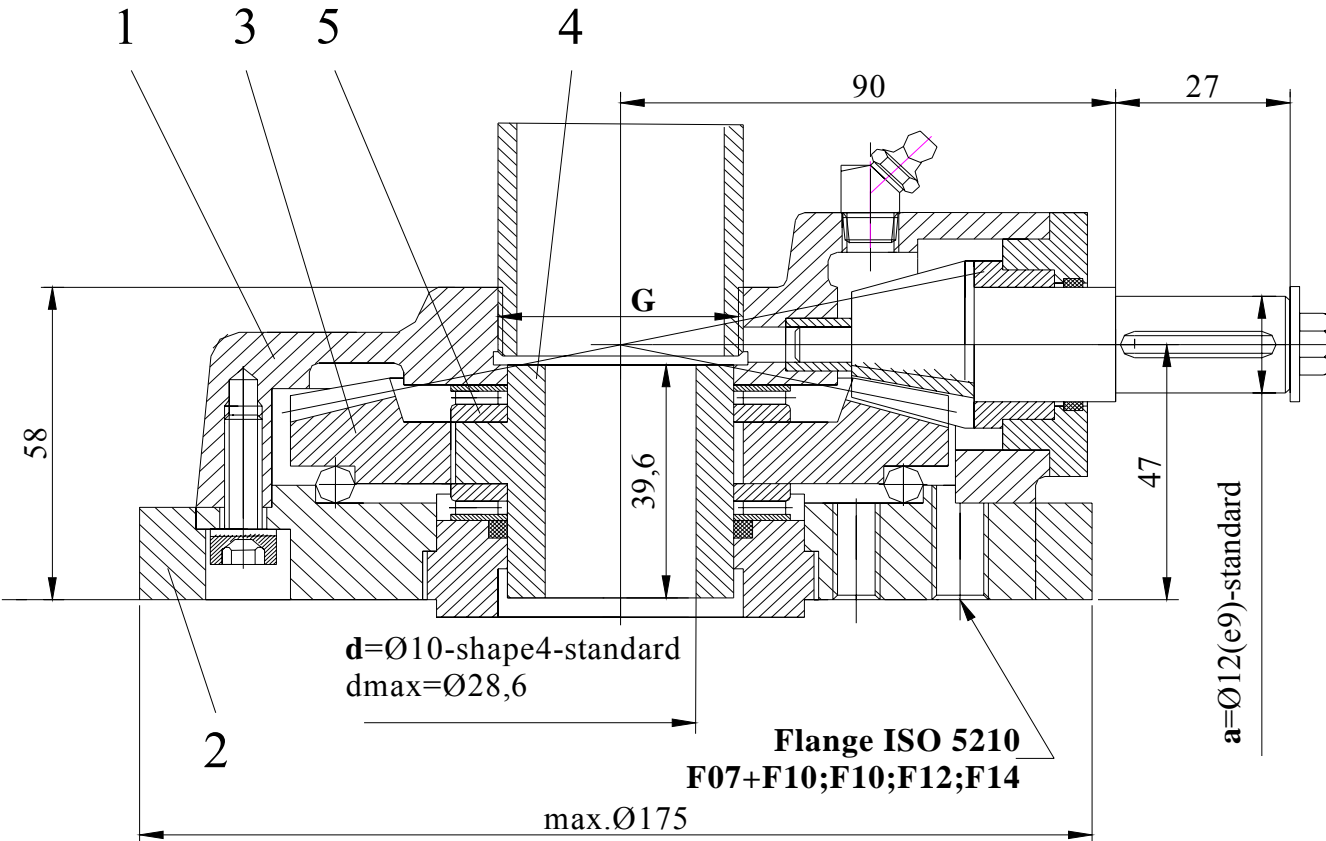
Crt nr.	Range Gama	Actuator Tip red.	Tech. sheet Nr.fisa the.	Date Data	
1	Manual multi-turn one-step bevel actuators type <b>RK</b>	RK-0.15	573a	22.07.2004	
2		RK-02	683a	27.07.2004	
3		RK-03	685b	03.06.2005	
4	Reductoare manuale multitura ,conice 1 treapta tip <b>RK</b>	RK-05	456a	22.07.2004	
5		RK-1	742b	27.09.2005	
6		RK-2.1	464a	26.07.2004	
7	Manual multi-turn bevel actuators with input spur de- multiplier type <b>2CK</b>	2CK-2.1	554a	14.09.2004	
8		2CK-3	553a	21.10.2002	
9		2CK-5	555a	14.09.2004	
10		2CK-8	547a	14.09.2004	
11		2CK-10	557a	14.09.2004	
12		2CK-12	558b	01.09.2006	
13		2CK-15	611b	01.09.2006	
14		2CK-15R	354a	10.12.2003	
15		2CK-18	630b	01.09.2006	
16		2CK-32	602b	01.09.2006	
17	Manual multi-turn spur actuators type <b>ICR</b>	2CK-32RM	907a	01.09.2006	
18		2CK-50	920	12.01.2005	
19		ICR-5	722b	01.09.2006	
20		ICR-10	773b	01.09.2006	
21		ICR-20	774b	01.09.2006	
22	Manual quarter-turn actuators with pressure cast aluminum housing type <b>AM-P</b>	ICR-50	776b	01.09.2006	
23		AM-0P	801	19.02.2004	
24	Reductoare manuale sfert de tura cu carcasa turnata din aluminium sub presiune tip <b>AM-P</b>	AM-1P	802	19.02.2004	
25		AM-1.5P	803	19.02.2004	
26	Manual quarter-turn actuators with cast-iron housing type <b>AM</b>	AM-2P	804	19.02.2004	
27		AM-3	517	14.08.2002	
28		AM-4	491	09.07.2002	
29	Reductoare manuale sfert de tura cu carcasa turnata din fonta tip <b>AM</b>	AM-5	518	14.08.2002	
30					
31	Manual quarter-turn actuators with cast-iron housing and de-multiplier type <b>R2CM</b>	R2CM-345	807	26.03.2004	
32		R2CM-425	808	26.03.2004	
33		R2CM-540	809	24.02.2004	
34		R2CMS-138	843a	04.05.2004	
35		R2CM-759	810	24.02.2004	
36		R2CM-897	811	24.02.2004	
37		R2CM-1200	812a	25.03.2004	
38		R2CM-1600	813	24.02.2004	
39		R2CM-2000	814	24.02.2004	
40		R2CM-3000	815a	24.02.2004	
41	Reductoare manuale sfert de tura cu carcasa turnata din fonta si demultiplicator tip <b>R2CM</b>	R2CM-4000	816a	24.02.2004	
42		R2CM-5000	817a	24.02.2004	
43		R2CM-6000	818a	24.02.2004	
44		R2CM-6500	819a	24.09.2004	
45		R2CM-8500	820a	24.02.2004	
46		Manual declutchable quarter-turn actuators with cast- iron housing (and de-multiplier) type <b>RMD</b>	RMD-0A	614b	05.03.2003
47			RMD-1A	615b	05.03.2003
48			RMD-2A	616b	05.03.2003
49	RMD-3A		617b	05.03.2003	
50	RMD-4A		618b	15.03.2003	
51	RMD-5		619b	05.03.2003	
52	Reductoare manuale sfert de tura debraiabile cu carcasa turnata din fonta si demultiplicator tip <b>RMD</b>	RMD-6	620b	15.03.2003	
53					

<b>56</b>	Manual declutchable quarter-turn actuators with cast-iron housing (and de-multiplier) type <b>RMD</b> Reductoare manuale sfert de tura debraiabile cu carcasa turnata din fonta si demultiplicator tip <b>RMD</b>	RMD-7	621b	05.03.2003
<b>60</b>		RMD-125M	466b	01.09.2006
<b>61</b>	Manual toggle-gear (travelling nut) actuators type <b>AV</b> Red. manuale sfert de tura cu parghii tip <b>AV</b>	AV-2	840	30.04.2004
<b>62</b>		AV-3	841	30.04.2004
<b>63</b>	Lockable actuating levers type <b>CAM</b> for quarter-turn valves Chei pentru actionare manuala tip <b>CAM</b>	CAM-1	778	15.12.2003
<b>64</b>		CAM-2	778	15.12.2003
<b>65</b>		CAM-3	778	15.12.2003
<b>66</b>	Alluminum handwheel Roti de aluminiu	RM-140	891	23.09.2004
<b>67</b>		RM-225	892	23.09.2004
<b>68</b>		AV-2	890	23.09.2004
<b>69</b>	Specification <b>RMD</b> Specificatie materiale <b>RMD</b>		Sp.128	



## BEVEL GEAR UNIT **RK – 0.15** FOR MULTI-TURN VALVES

Sheet no.	573a
Date	22.07.2004



### MATERIALS

- 1. Bevel gear housing: OT 450/GS-45
- 2. Intermediate: OL 50/St50
- 3. Bevel gear: OLC 45 / C 45
- 4. Driving nut: CuAl10Fe3T  
Fagn Ni22
- 5. Bearings: ANK 3552

### TECHNICAL FEATURES

- Bevel gear ratio: 4
- Output torque: 150 N m
- Axial load: 50kN

Ratio	Input torque (N m)	D (mm)	Handwheel tangential force (N)
4	47	140	2x334
		225	2x208

### ORDERING CODE :

**RK 0.15** x **4** - **F10** - **OB** - **12** - **1 1/8"** - **4 / 10**

Type

Ratio

Coupling flange **ISO 5210**

**OB**- Driving nut B z -standard

**OF**- Driving nut F a g n Ni 22

**d**- Coupling shape dimension

**d**-Coupling shape code-acc. to NCI-30

**G**-Stem tube thread

**a**-Input shaft diameter-**key** acc. to DIN 6885

Handwheel – **Ø 225-standard**

Ø 140

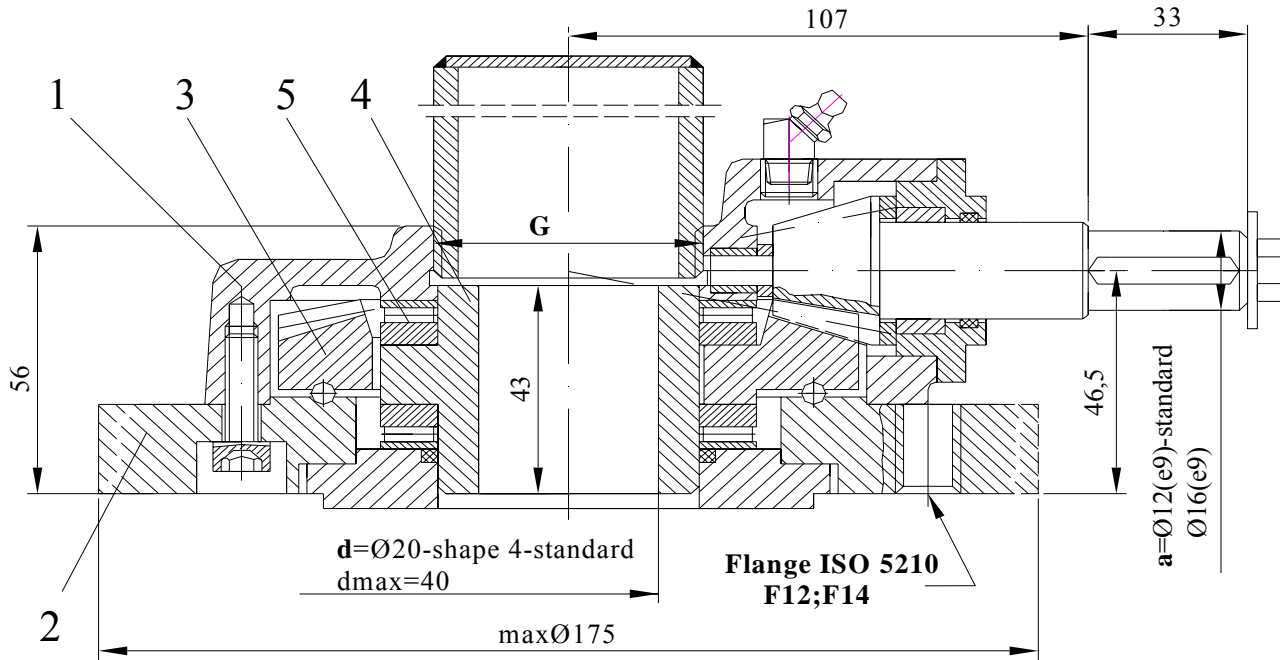
Stem tube – **A 38(1 1/8")**

*Should be ordered Separately!*



# BEVEL GEAR UNIT **RK – 0.3** FOR MULTI-TURN VALVES

Sheet nr.	685 b
Date	03.06.2005



MATERIALS	
1.Bevel gear housing:	OT 450/GS 45
2.Intermediate:	OL 50/St50
3.Bevel gear:	OLC 45/C45
4.Driving nut:	Cu Al10 Fe 3T Fagn Ni 22
5.Bearings:	ANK 5070

TECHNICAL FEATURES	
• Bevel gear ratio:	4
• Output torque:	300 Nm
• Axial load	70 kN

Ratio	Input torque (Nm)	D (mm)	Handwheel tangential force (N)
4	93	225	2x412
		350	2x265

### ORDERING CODE :

**RK 0.3 x 4 - F14 - OB - 16 - 1 1/2" - 4 / 20**

Type	Ratio	Coupling flange ISO 5210	OB- Driving nut Bz -standard	OF- Driving nut Fagn Ni 22	d- Coupling shape dimension	d-Coupling shape-acc. to NCI-30	G-Stem tube thread	a-Input shaft diameter-key acc. to DIN 6885
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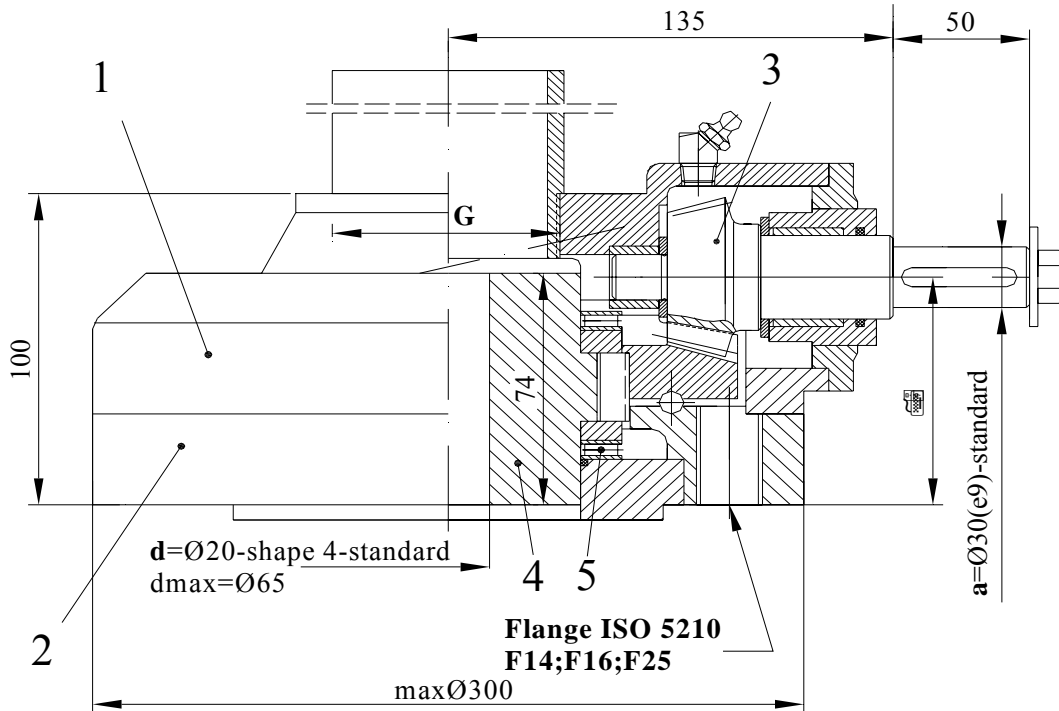
*Handwheel –A350 -standard  
 A225  
 Stem tube – A48(1 1/2")  
 Should be ordered separately!*





# BEVEL GEAR UNIT **RK – 1** FOR MULTI-TURN VALVES

Sheet nr.	742b
Date	27.09.2005



MATERIALS	
1. Bevel gear housing:	OT 450/GS 45
2. Intermediate:	OL 50/St50
3. Bevel gear:	OLC 45/C45
4. Driving nut:	Cu Al10Fe 3T Fagn Ni 22
5. Bearings:	ANK 90120

TECHNICAL FEATURES	
• Bevel gear ratio:	4
• Output torque:	1000 Nm
• Axial load:	230 kN

Ratio	Input torque (Nm)	D (mm)	Handwheel tangential force(N)
4	312	350	2x890
		400	2x780
		600	2x617
6	217	350	2x472
		400	2x540
		600	2x360

### ORDERING CODE :

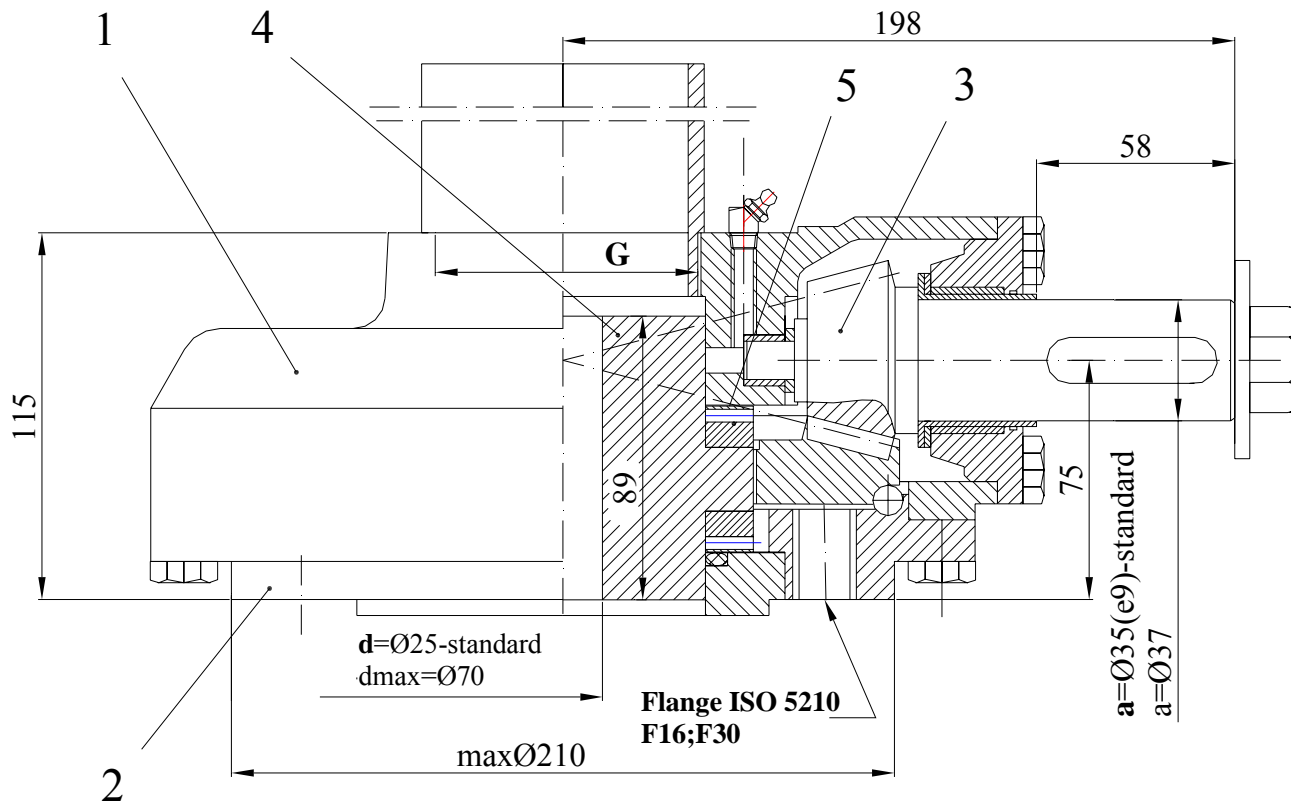
**RK 1** x **4** - **F16** - **OB** - **30** - **2 3/8"** - **4 / 20**

Type	Ratio	Coupling flange ISO 5210	OB- Driving nut Bz -standard	OF- Driving nut Fagn Ni 22	<b>d</b> - Coupling shape dimension	<b>d</b> -Coupling shape code-acc. to NCI-30	<b>G</b> -Stem tube thread	<b>a</b> -Input shaft diameter-key acc. to DIN 6885
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*Hand wheel – A600-standard  
 A350;A400 ;  
 Stem tube – A70(2 3/8)  
 Should be ordered separately!*



# BEVEL GEAR UNIT **RK -2.1** FOR MULTI-TURN VALVES



Sheet no.	464d
Date	01.03.2007

MATERIALS	
1.Bevel gear housing:	OT 450/GS 45
2.Intermediate:	OL 50/St 50
3.Bevel gear:	OLC 45 / C45
4.Draving nut:	Cu Al10 Fe 3T
	Fagn Ni 22
5.Bearings:	ANK 90120

TECHNICAL FEATURES	
• Bevel gear ratio:	6
• Output torque:	2000 Nm
• Axial load:	320 kN

Ratio	Input torque (N m)	D (mm)	Handwheel tangential force(N)
<b>6</b>	<b>416</b>	400	2x1040
		<b>600</b>	<b>2x693</b>
		800	2x520

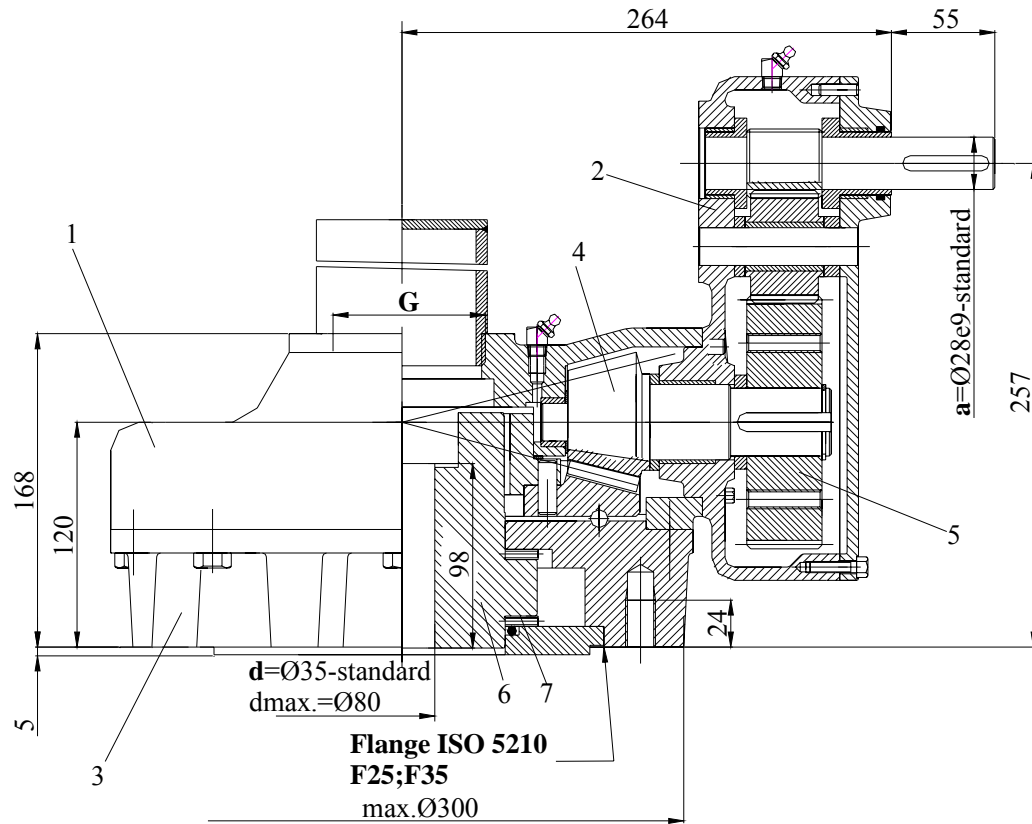
### ORDERING CODE :

<b>RK 2.1</b>	<b>x 6</b>	<b>- F16</b>	<b>- OB</b>	<b>- 35</b>	<b>- 3"</b>	<b>- 4 / 25</b>
Type	Ratio	Coupling flange ISO 5210	OB- Driving nut Bz -standard OF- Driving nut Fagn Ni 22			<b>d</b> - Coupling shape dimension <b>d</b> -Coupling shape code-acc. to NCI-30 <b>G</b> -Stem tube thread <b>a</b> -Input shaft diameter- <b>key</b> acc. to DIN 6885

*Handwheel – A800-standard  
 A400 ; A600  
 Stem tube – A70(3")  
 Should be ordered separately!*



# SPUR-BEVEL UNIT FOR MULTI-TURN VALVES 2CK-3



Sheet no.	553a
Date	21.10.2002

MATERIALS	
1. Bevel gear housing:	OT 450/GS 45
2. Cylindrical gear housing:	OT450/GS 45
3. Intermediate:	OT 450/GS 45
4. Bevel gear:	OLC 45/C45
5. Cylindrical gear:	OLC45/C45
6. Driving nut:	Cu Al10Fe 3T Fagn Ni 22
7. Bearing:	AXK110145

TECHNICAL FEATURES	
• Bevel gear ratio:	16
• Output torque:	3300 Nm
• Axial load:	380 kN

Ratio	Input torque (Nm)	D (mm)	Handwheel Tangential force(N)
16	327	600	2x545
	327	800	2x400

## ORDERING CODE :

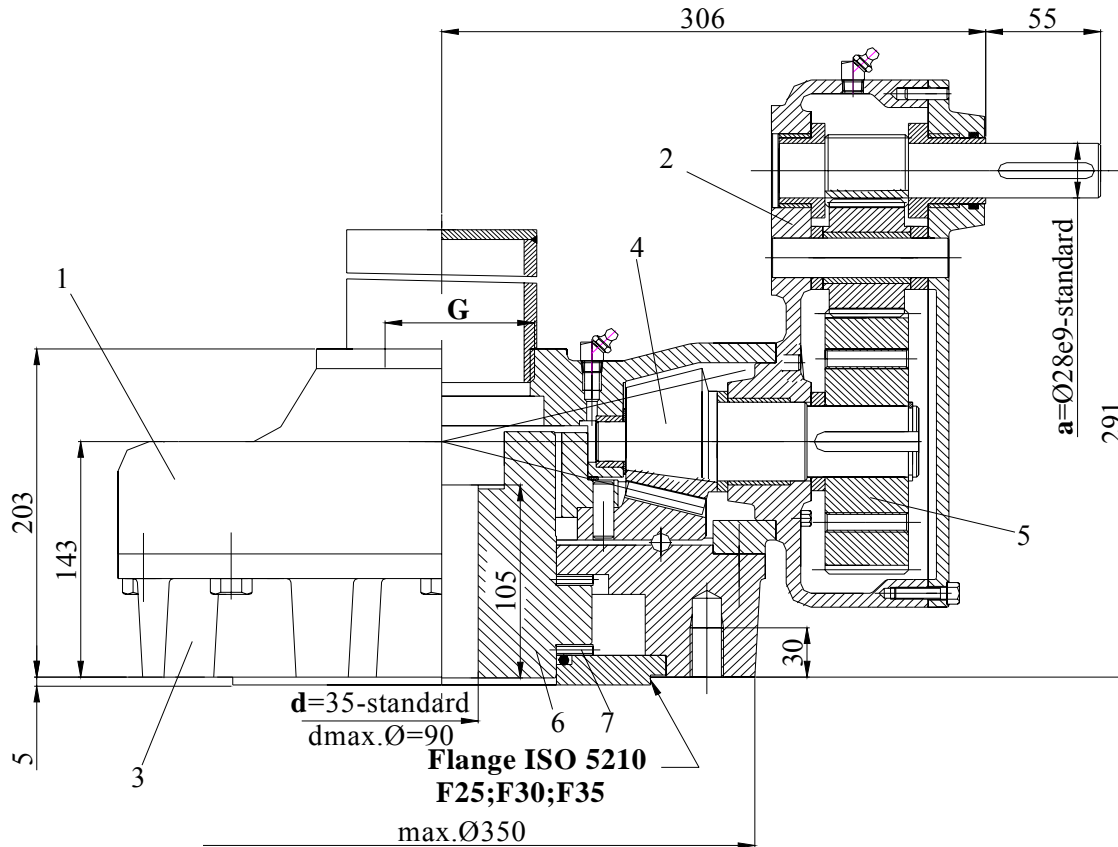
<b>2CK 3</b>	<b>x</b>	<b>16</b>	<b>-</b>	<b>F25</b>	<b>-</b>	<b>OB</b>	<b>-</b>	<b>28</b>	<b>-</b>	<b>3"</b>	<b>-</b>	<b>4</b>	<b>/</b>	<b>35</b>
Type														d- Coupling shape dimension
Ratio														d-Coupling shape code-acc. to NCI-30
Coupling flange ISO 5210														G-Stem tube thread
OB- Driving nut Bz -standard														a-Input shaft diameter-key acc. to DIN 6885
OF- Driving nut Fagn Ni 22														

Handwheel	-	<b>A800-standard</b>
		A600
Stem tube	-	<b>A88,9(3")</b>
<i>Should be ordered separately!</i>		

# SPUR-BEVEL UNIT FOR MULTI-TURN VALVES 2CK-5



Sheet no.	555a
Date	14.09.2004



MATERIALS	
1.Bevel gear housing:	OT 450/GS 45
2.Cylindrical gear housing:	OT450/GS 45
3.Intermediate:	OT 450/GS 45
4.Bevel gear:	OLC 45/C45
5.Cylindrical gear:	OLC45/C45
6.Driving nut:	Cu Al10Fe 3T Fagn Ni 22
7.Bearing:	AXK120155

TECHNICAL FEATURES	
● Bevel gear ratio:	24;40
● Output torque:	5000 N m
● Axial load:	570 k N

Ratio	Input torque (N m)	D (mm)	Handwheel Tangential force(N)
24	340	600	2x570
40	205	600	2x345

Handwheel - A800-standard  
 A600  
 Stem tube - A102(3 1/2")-standard  
 A115(4")  
 Should be ordered separately!

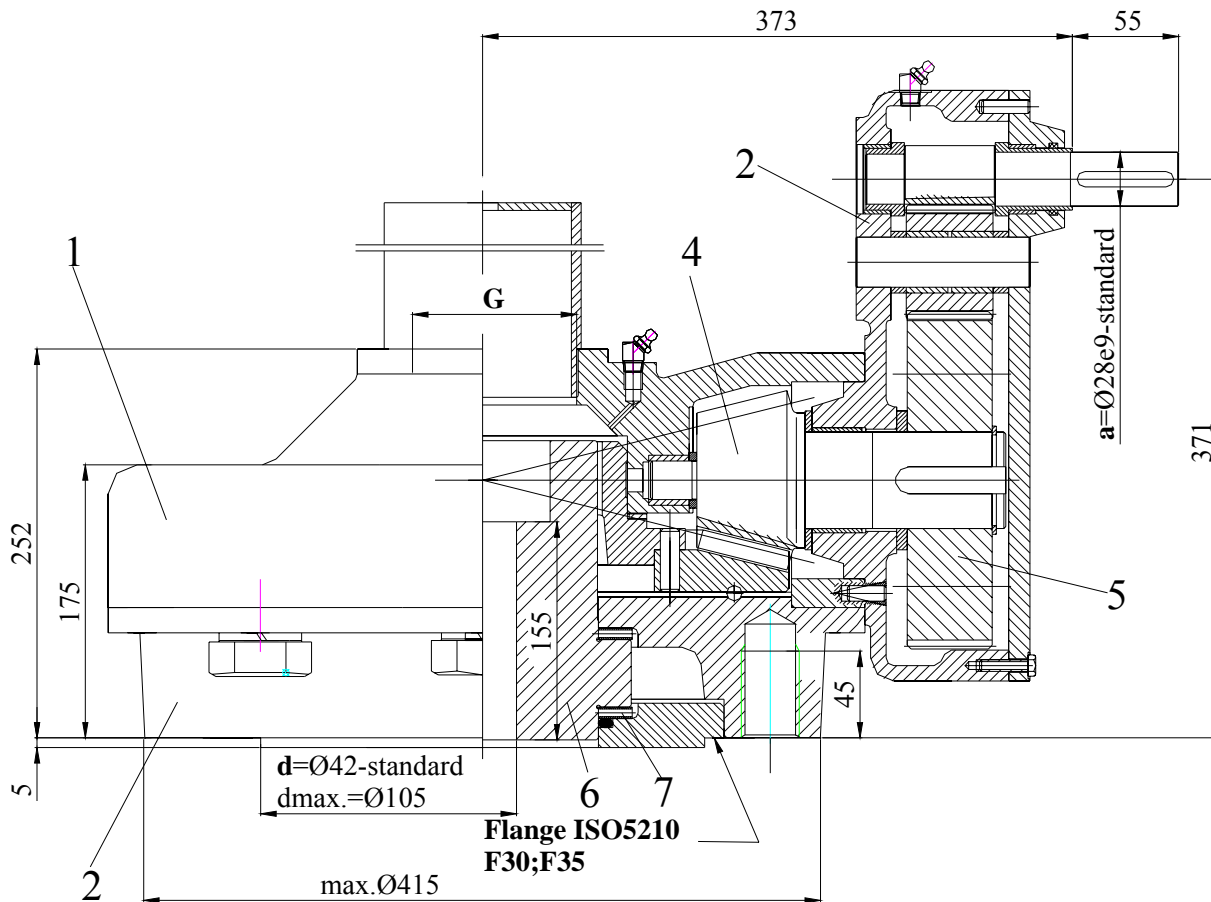
### ORDERING CODE :

**2CK 5 x 24 - F30 - OB - 28 - 3 1/2" - 4 / 35**

Type	Ratio	Coupling flange ISO 5210	OB- Driving nut Bz -standard OF- Driving nut Fagn Ni 22	28	3 1/2"	4	35	d- Coupling shape dimension d-Coupling shape code-acc. to NCI-30 G-Stem tube thread a-Input shaft diameter-key acc. to DIN 6885
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# SPUR-BEVEL UNIT FOR MULTI-TURN VALVES 2CK-8



Sheet no.	547a
Date	14.09.2004

### MATERIALS

1.Bevel gear housing:	OT 450/GS 45
2.Cylindrical gear housing:	OT450/GS 45
3.Intermediate:	OT 450/GS 45
4.Bevel gear:	OLC 45/C45
5.Cylindrical gear:	OLC45/C45
6.Driving nut:	Cu Al10Fe 3T Fagn Ni 22
7.Bearing:	AXK140180

### TECHNICAL FEATURES

• Total gear ratio:	34,6;58
• Output torque:	8000 Nm
• Axial load:	800 kN

Ratio	Input torque (Nm)	D (mm)	Handwheel Tangential force(N)
34,6	385	800	2x480
58	230	800	2x290

### ORDERING CODE :

**2CK 8 x 34,6 - F35 - OB - 28 - 5" - 4 / 42**

Type	Ratio	Coupling flange ISO 5210	OB- Driving nut Bz -standard OF- Driving nut Fagn Ni 22	28	5"	4 / 42	d- Coupling shape dimension d-Coupling shape code-acc. to NCI-30 G-Stem tube thread a-Input shaft diameter-key acc. to DIN 6885
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Handwheel	- A800-standard A600
Stem tube	- A141,3(5")
<i>Should be ordered separately!</i>	





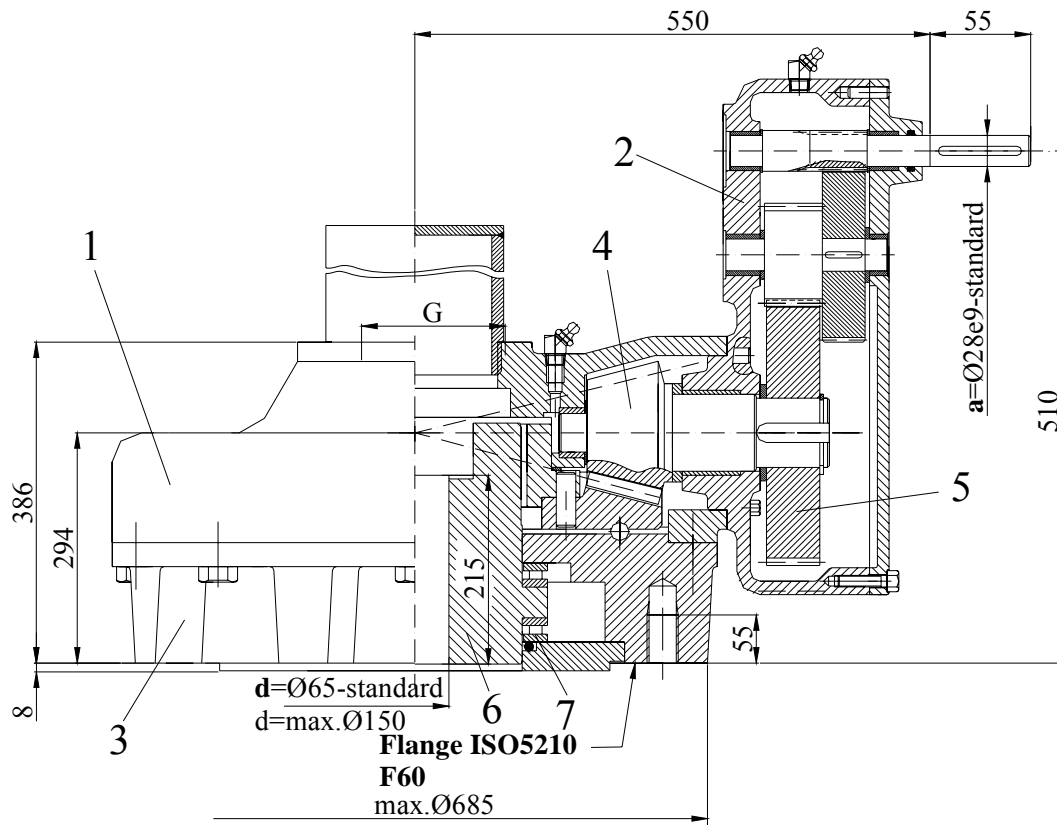




# SPUR-BEVEL UNIT FOR MULTI-TURN VALVES 2CK-32



Sheet no.	602b
Date	01.09.2006



## MATERIALS

1. Bevel gear housing:	OT 450/GS 45
2. Cylindrical gear housing:	OT450/GS 45
3. Intermediate:	OT 450/GS 45
4. Bevel gear:	OLC 45/C45
5. Cylindrical gear:	OLC45/C45
6. Driving nut:	Cu Al10Fe 3T Fagn Ni 22
7. Bearing:	81144M

## TECHNICAL FEATURES

• Total ratio:	122,6;190
• Output torque:	32000 Nm
• Axial load:	1575 kN

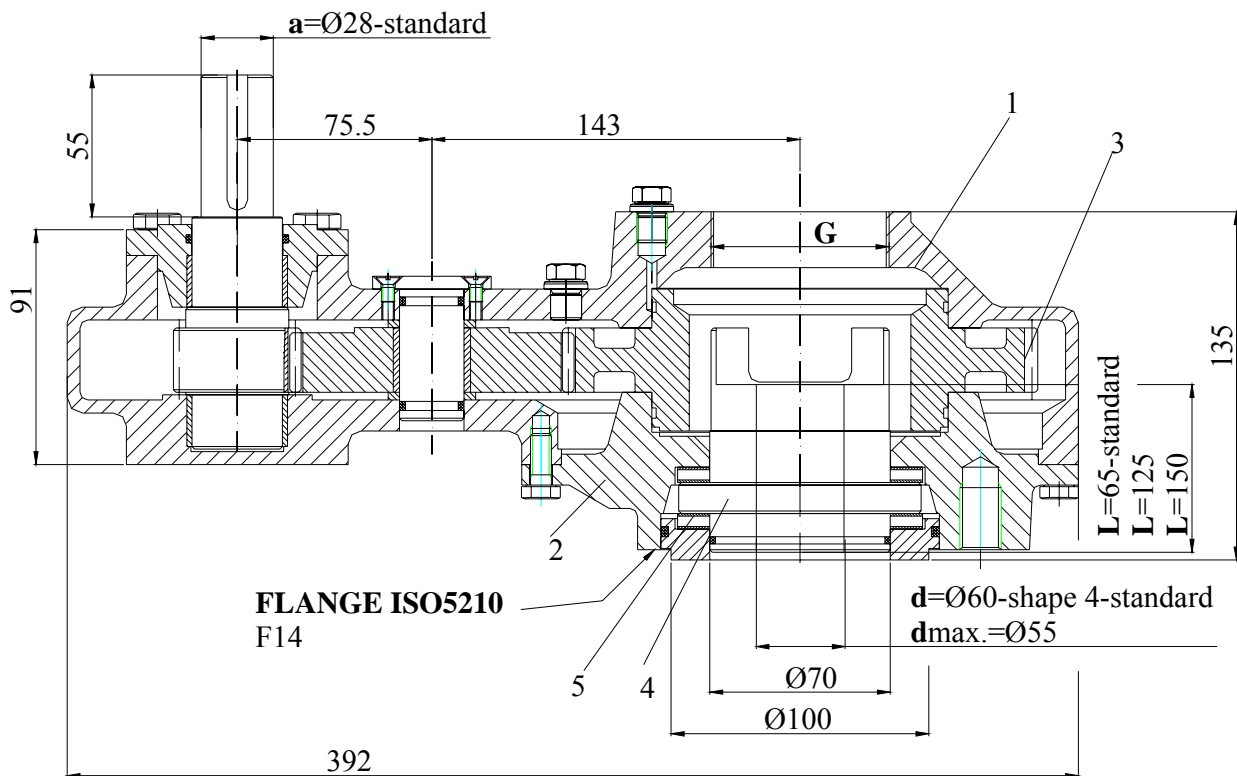
Ratio	Input torque (Nm)	D (mm)	Handwheel tangential force(N)
122,6	435	800	2x592
190	210	800	2x265

## ORDERING CODE :

<b>2CK 32</b>	<b>x</b>	<b>122,6</b>	<b>-</b>	<b>F60</b>	<b>-</b>	<b>OB</b>	<b>-</b>	<b>28</b>	<b>-</b>	<b>6"</b>	<b>-</b>	<b>4 / 65</b>
Type												d- Coupling shape dimension
Ratio												d-Coupling shape code-acc. to NCI-30
Coupling flange ISO 5210												G-Stem tube thread
OB- Driving nut Bz -standard												a-Input shaft diameter-key acc. to DIN 6885
OF- Driving nut Fagn Ni 22												

Handwheel - **A800-standard**  
A600  
Stem tube - **A170(6")**  
*Should be ordered separately!*

## BEVEL GEAR UNIT ICR-5



Sheet no.	772b
Date	01.09.2006

### MATERIALS

1.Helical gear housing:	Fc 250/GG25
2.Intermediate:	Fc 250/GG25
3.Helical gear:	OLC 45 / C 45
4.Driving nut:	CuAl10Fe3T
5.Bearing:	ANK7095

### TECHNICAL FEATURES

● Bevel gear ratio:	4
● Output torque :	500 N m
● Axial load:	120kN

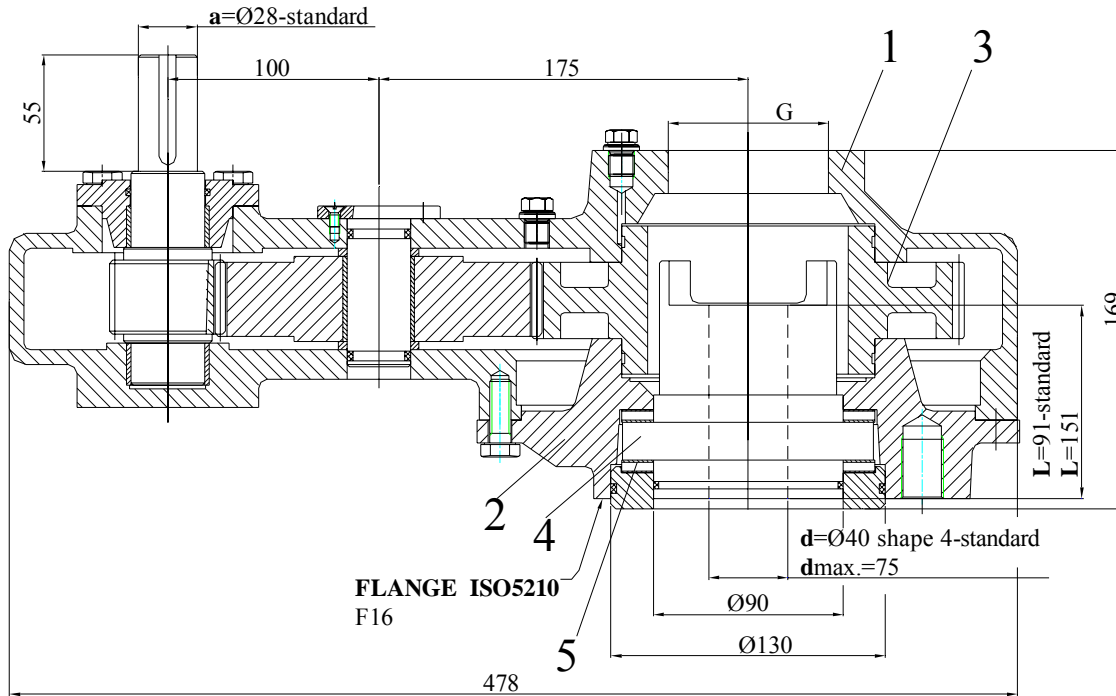
### ORDERING CODE :

<b>ICR-5</b>	<b>x 4</b>	<b>- F14</b>	<b>- 28</b>	<b>- 2 3/8"</b>	<b>- 1</b>	<b>/ 50</b>	<b>- 65</b>
Type	Ratio	Coupling flange output ISO5210	a-Input shaft diameter-key acc.to DIN 6885		d- Coupling shape code-acc.to NCI 30	L= Nut width	
					G-Stem tube thread		

*Hand wheel – max. A350  
Guard:A70(2 3/8")  
Should be ordered separately!*

## BEVEL GEAR UNIT ICR-10

Sheet nr.	773b
Date	29.05.2006



### MATERIALS

1. Helical gear housing.....Fc 250/GG25
2. Intermediate.....Fc 250/GG25
3. Helical gear.....OLC 45 / C 45
4. Driving bush.....Al10Fe3T/G-SnBz10
5. Bearings.....ANK 90120

### TECHNICAL FEATURES

- Bevel gear ratio: 4
- Output torque: 1000 Nm

### ORDERING CODE :

**ICR-10** x **4** - **F16** - **28** - **3"** - **1 / 90** - **91**

Type

Ratio

Coupling flange output ISO5210

a-Input shaft diameter-key acc.to DIN 6885

L= Nut width

d- Coupling shape dimension

d- Coupling shape code-acc.to NCI 30

G-Stem tube thread

*Hand wheel – max.A400*

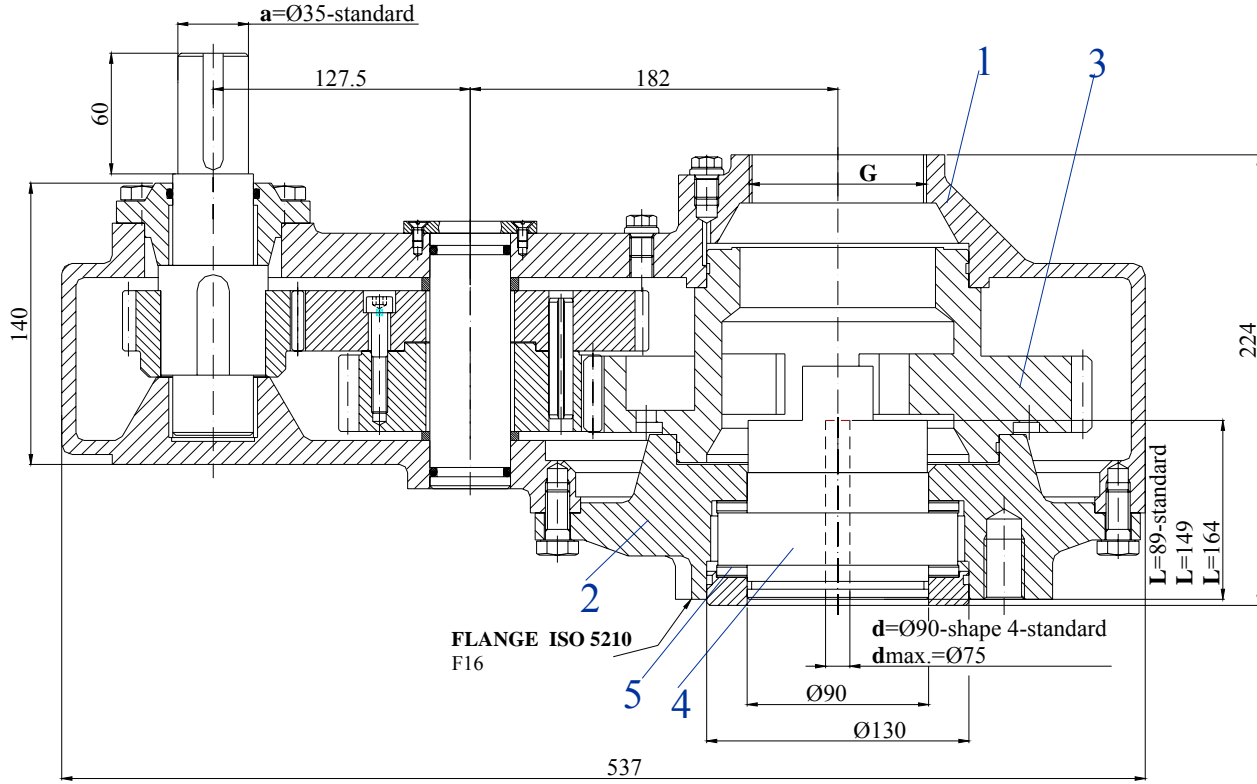
*Guard:A88,9(3")*

*Should be ordered separately!*

# BEVEL GEAR UNIT ICR-20



Sheet no.	774b
Date	01.09.2006



MATERIALS	
1.Helical gear housing:	F c 250/GG25
2.Intermediate:	F c 250/GG25
3.Helical gear:	OLC 45 / C 45
4.Driving nut:	CuAl10Fe3T
5.Bearing:	ANK60120

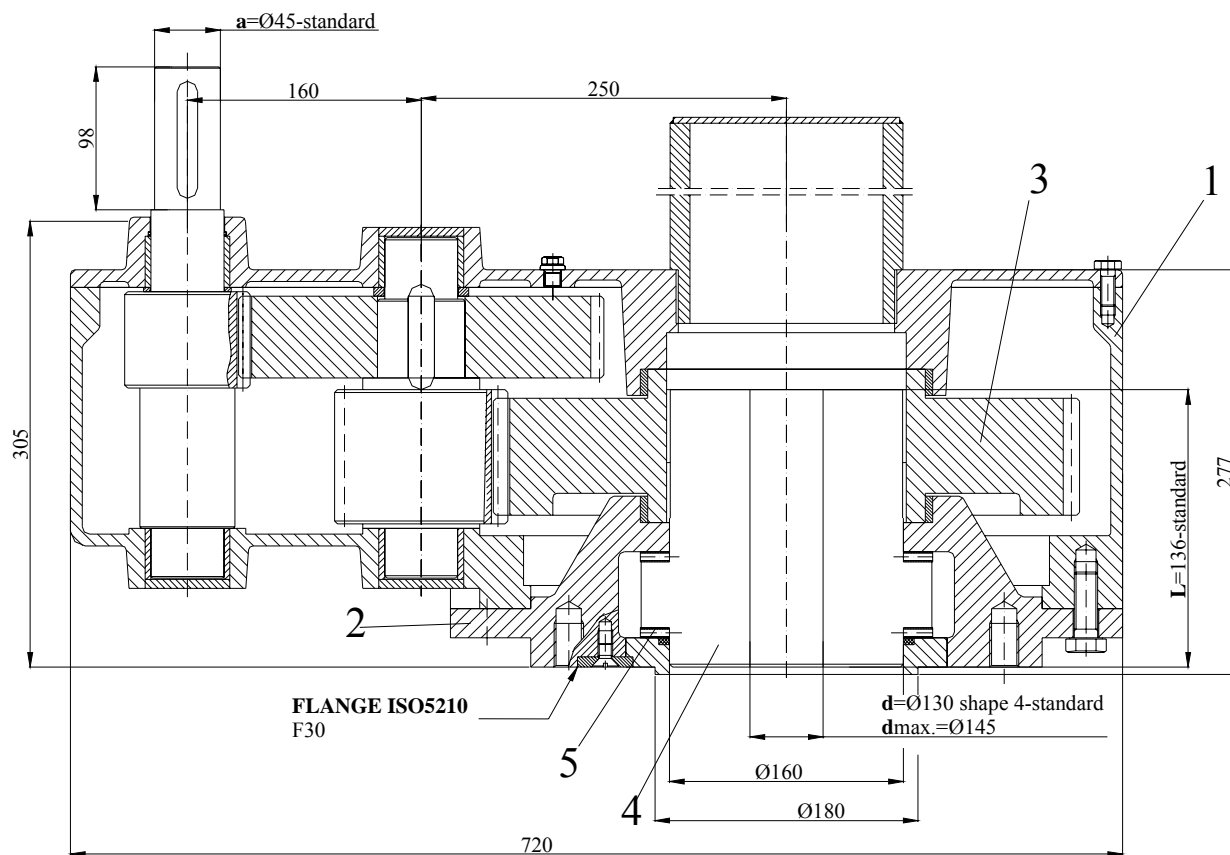
TECHNICAL FEATURES	
• Bevel gear ratio:	4,2;6;10
• Output torque:	2000 N m
• Axial load:	320kN

## ORDERING CODE :

<b>ICR-20</b>	<b>x 6</b>	<b>- F16</b>	<b>- 35</b>	<b>- 3"</b>	<b>- 1</b>	<b>/ 50</b>	<b>- 89</b>
Type	Ratio	Coupling flange output ISO5210	a-Input shaft diameter-key acc.to DIN 6885			d- Coupling shape code-acc.to NCI 30	L= Nut width
						d- Coupling shape dimension	G-Stem tube thread

*Hand wheel – A400;max.A500  
Guard:A88,9(3")  
Should be ordered separately!*

## BEVEL GEAR UNIT ICR-50



Sheet no.	776b
Date	01.09.2006

### MATERIALS

1.Helical gear housing:	OL 37/St 37
2.Intermediate:	F c 250/GG25
3.Helical gear:	OLC 45 / C 45
4.Driving nut:	CuAl10Fe3T
5.Bearing:	AXK160200

### TECHNICAL FEATURES

• Bevel gear ratio:	12
• Output torque:	5000 Nm
• Axial load:	570 kN

### ORDERING CODE :

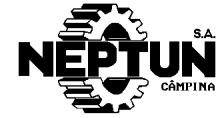
**ICR-50 x 12 - F30 - 45 - 5 1/2" - 1 / 130 - 136**

Type			
Ratio			
Coupling flange output ISO5210			
a-Input shaft diameter-key acc.to DIN 6885			

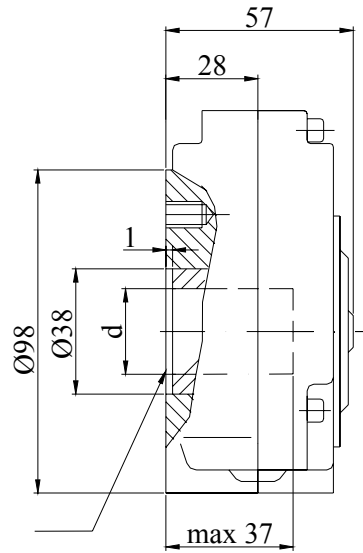
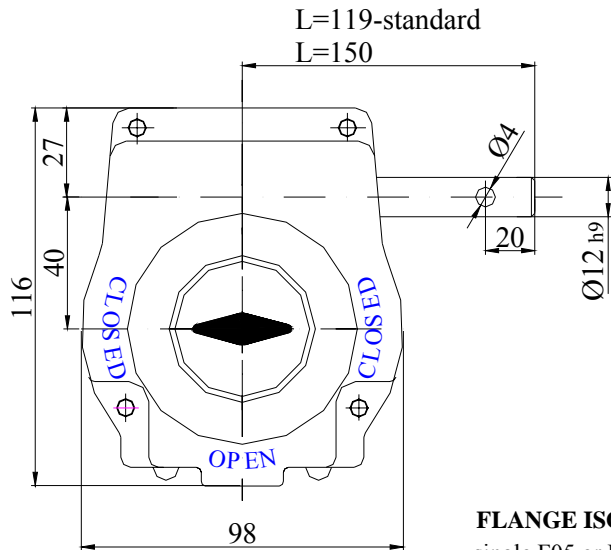
L= Nut width			
d- Coupling shape dimension			
d- Coupling shape code-acc.to NCI 30			
G-Stem tube thread			

Hand wheel – max.A600  
Guard-A150(5 1/2")  
*Should be ordered separately!*

# WORM UNIT AM-0P FOR 1/4 TURN VALVES



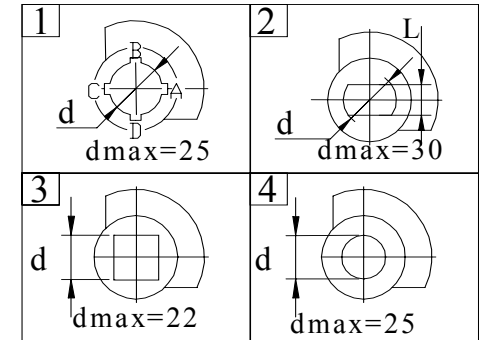
Sheet no.	801
Date	19.02.2004



**FLANGE ISO 5211**  
 single F05 or F07  
 double F05+F07

Alluminum handwheel -ø140-standard  
 Should be ordered separately!

### COUPLING SHAPE(TOP VIEW)



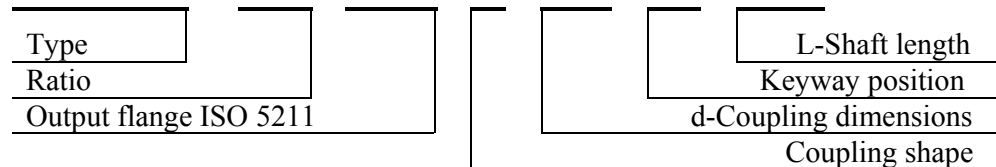
Nr	Description	Material	Specification
1	Housing	Alluminum	G-ALSi10Mg-DIN1725
2	Input worm shaft	Carbon Steel	C45DIN17200
3	Quadrant	Ductile Iron	GGG40-DIN1693
4	Bushing	Synthered Alloy	FC 10-52
5	Bearing	-	61901-DIN 625
6	Set-screw	Carbon Steel	Gr8.8-DIN916
7	"O"ring	Nitrile	DIN 3771
8	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque.....	140 Nm
Input rated torque.....	23 10% Nm
Ratio.....	41
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	10,25
Capsulation.....	IP 54

### ORDERING CODE :

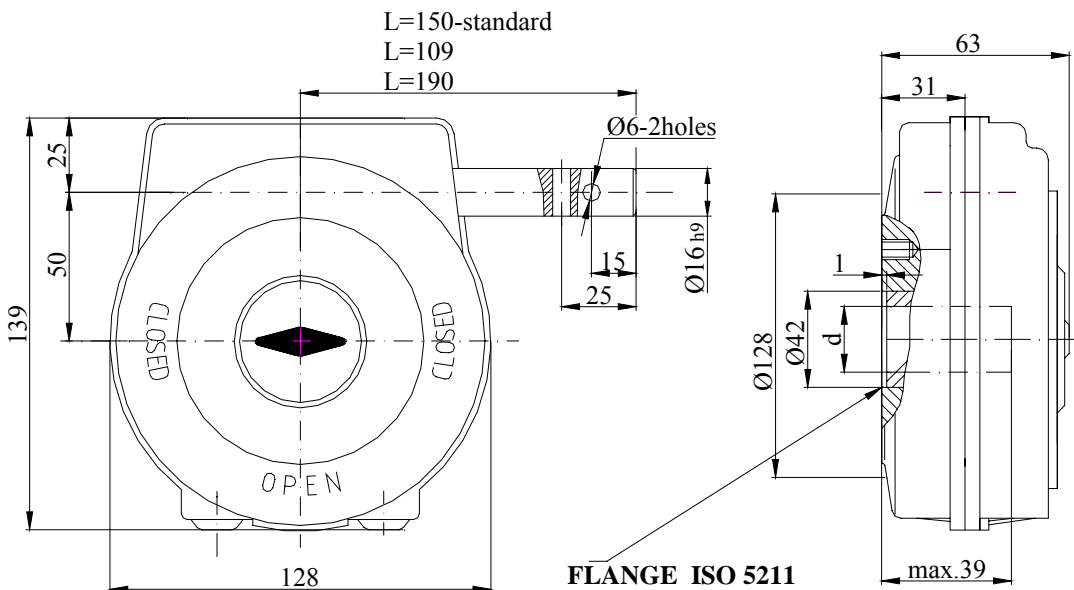
**AM 0P x 41 - F07 / 1 / 20 - A - 119**



## WORM UNIT AM-1P FOR 1/4 TURN VALVES



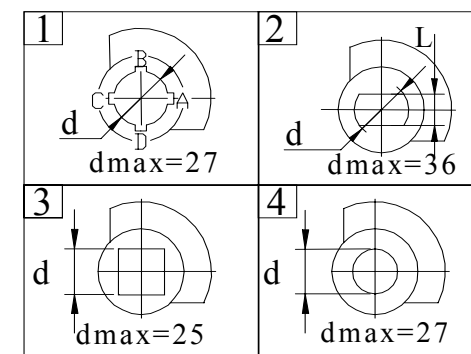
Sheet no.	802
Date	19.02.2004



L=150-standard  
L=109  
L=190

**FLANGE ISO 5211**  
single F05 or F07 or F10  
double F05+F07 or F07+F10 or F05+F10  
triple F05+F07+F10

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housing	Alluminum	G-ALSi10Mg-DIN1725
2	Input worm shaft	Carbon Steel	C45-DIN17200
3	Quadrant	Ductile Iron	GGG40-DIN1693
4	Bushing	Synthered Alloy	F40-U20-6
5	Set-screw	Carbon Steel	Gr8.8-DIN916
6	"O"ring	Nitrile	DIN 3771
7	Grease	Lithium-Calcium	UM170LiCaPb2

Alluminum handwheel – ø225-standard  
– ø140  
*Should be ordered separately!*

### TECHNICAL FEATURES:

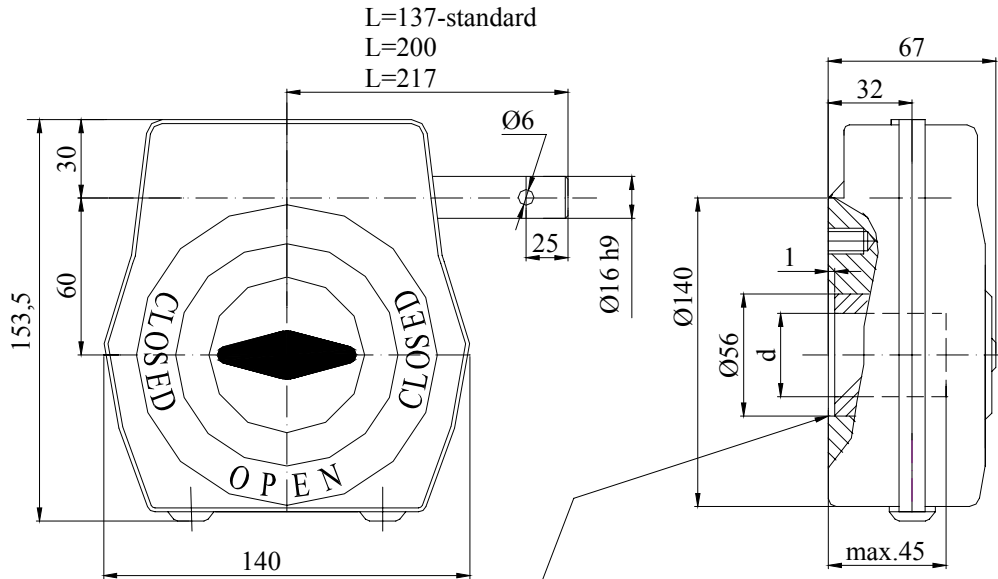
Output rated torque.....270 Nm  
Input rated torque.....33,8 10% Nm  
Ratio.....40  
Output angular stroke.....90 5  
Hendwheel turns for a complete stroke.....10  
Capsulation.....IP 54

### ORDERING CODE :

**AM 1P x 40 - F10 / 1 / 25 - A - 150**

Type				L-Shaft length
Ratio				Keyway position
Output flange ISO 5211				d- Coupling dimensions
				Coupling shape

## WORM UNIT AM-1.5P FOR 1/4 TURN VALVES

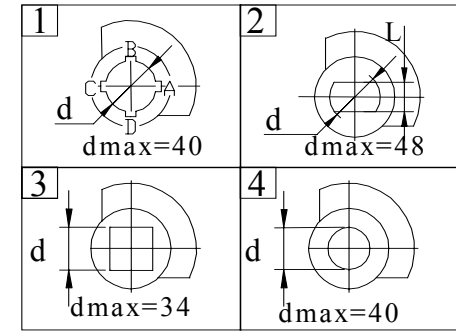


**FLANGE ISO 5211**  
 single F07 or F10 or F12  
 duble F07+F10 or F07+F12 or F10+F12  
 triple F07+F10+F12

Alluminum handwheel –ø225-standard  
*Should be ordered separately!*

Sheet nr.	803
Date	19.02.2004

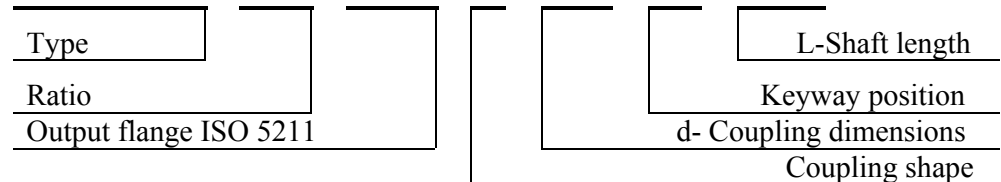
### COUPLING SHAPE



Nr	Description	Material	Specification
1	Housing	Alluminum	G-AlSi10Mg-DIN1725
2	Input worm shaft	Carbon Steel	C45-DIN17200
3	Quadrant	Ductile Iron	GGG40-DIN1693
4	Bushing	Synthered Alloy	F40-U20-60
5	Set-screw	Carbon Steel	Gr8.8-DIN916
6	“O”ring	Nitrile	DIN 3771
7	Grease	Lithium-Calcium	UM170LiCaPb2

### ORDERING CODE :

**AM 1,5P x 40 - F12 / 1 / 30 - A - 137**



### TECHNICAL FEATURES:

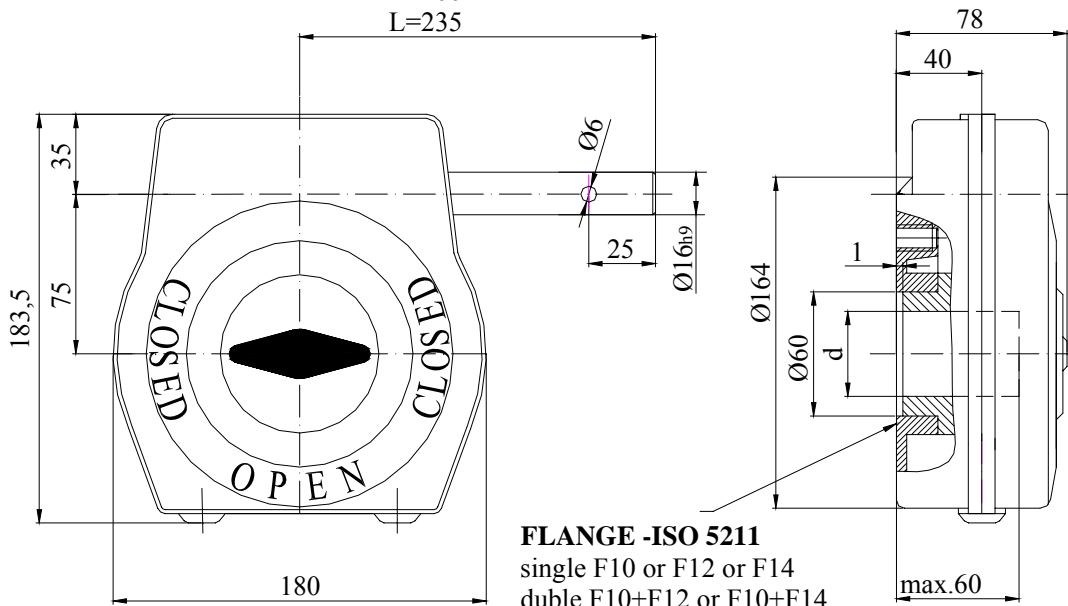
Output rated torque.....400 Nm  
 Input rated torque.....40 10% Nm  
 Ratio.....40  
 Output angular stroke.....90 5  
 Handwheel turns for a complete stroke.....10  
 Capsulation.....IP 54

# WORM UNIT AM-2P FOR 1/4 TURN VALVES



Sheet nr.	804
Date	19.02.2004

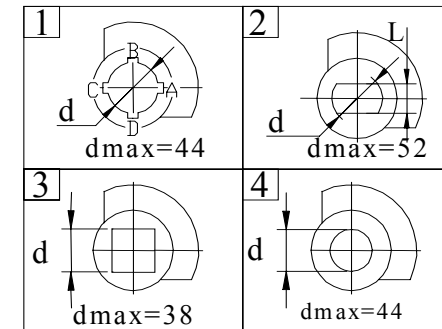
L=135-standard  
L=200  
L=235



**FLANGE -ISO 5211**  
single F10 or F12 or F14  
duble F10+F12 or F10+F14

**Alluminum handwheel -ø225-  
standard**

### COUPLING SHAPE



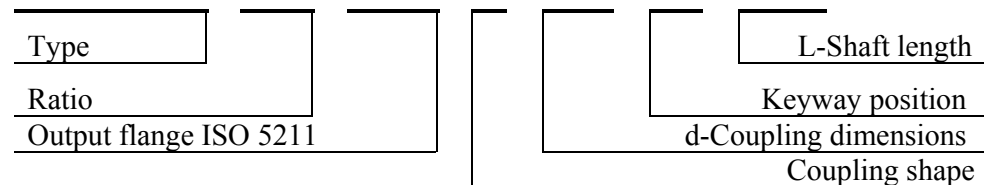
Nr	Description	Material	Specification
1	Housing	Alluminum	G-AlSi10Mg-DIN1725
2	Input worm shaft	Carbon Steel	C45-DIN17200
3	Quadrant	Ductile Iron	GGG40-DIN1693
4	Bushing	Synthered Alloy	F40-U20-60
5	Set-screw	Carbon Steel	Gr8.8-DIN916
6	"O"ring	Nitrile	DIN 3771
7	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque.....800 Nm  
Input rated torque.....83,3 / 64,4 10% Nm  
Ratio.....48 / 68  
Output angular stroke.....90 5  
Handwheel turns for a complete stroke.....12 / 17  
Capsulaation.....IP 54

### ORDERING CODE :

**AM 2P x 48 - F12 / 1 / 25 - A - 135**



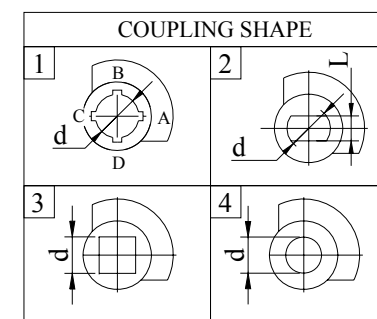
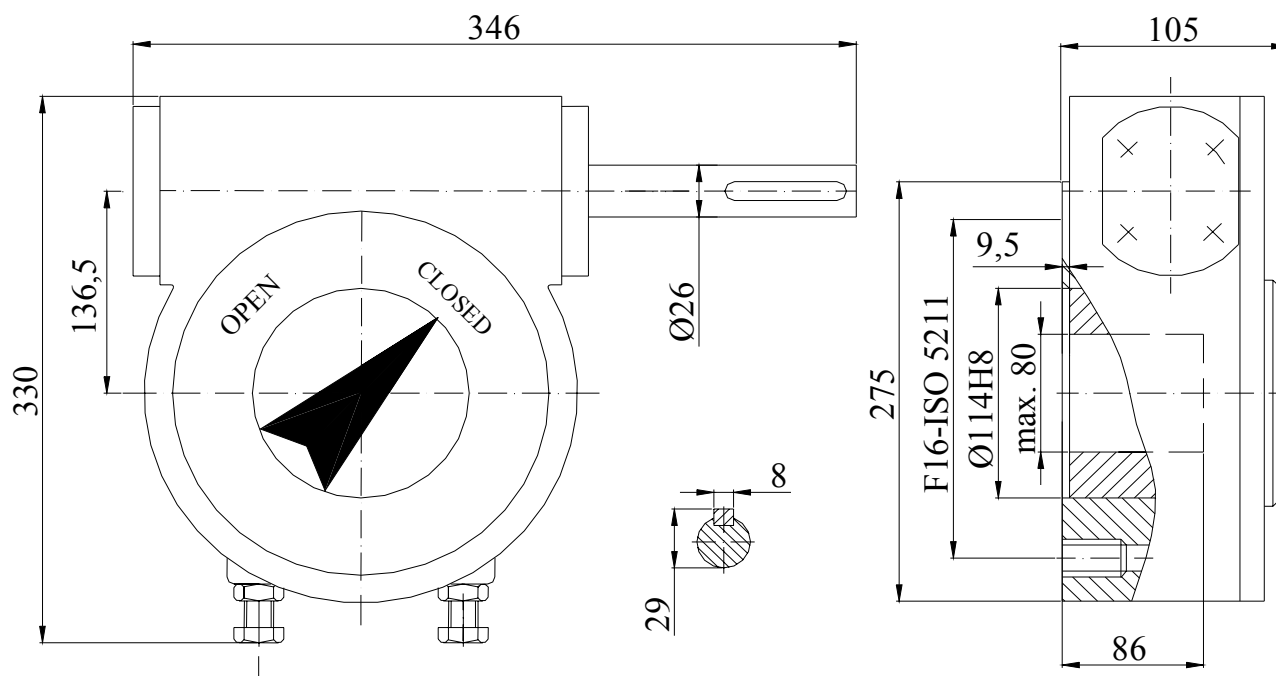


Intocmit : des. Moga C  
 Aprobat: Ing.C.Padure



## WORM UNIT FOR 1/4 TURN VALVES AM-4

Sheet nr.	491
Date	9.07.2002

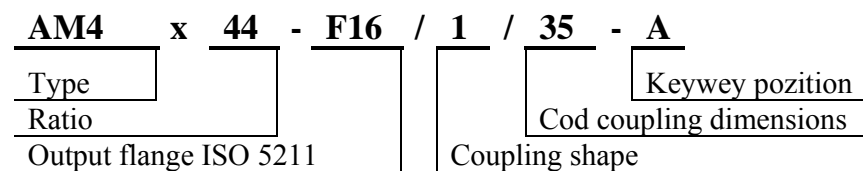


Hand wheel -ø300 ;ø 450 ; ø600  
 Flange ISO 5211 : F16

### TECHNICAL FEATURES:

Output rated torque.....2400 Nm  
 Input rated torque.....139 10% Nm  
 Ratio.....44  
 Output angular stroke.....90 5  
 Handwheel turns for a complet stroke.....11

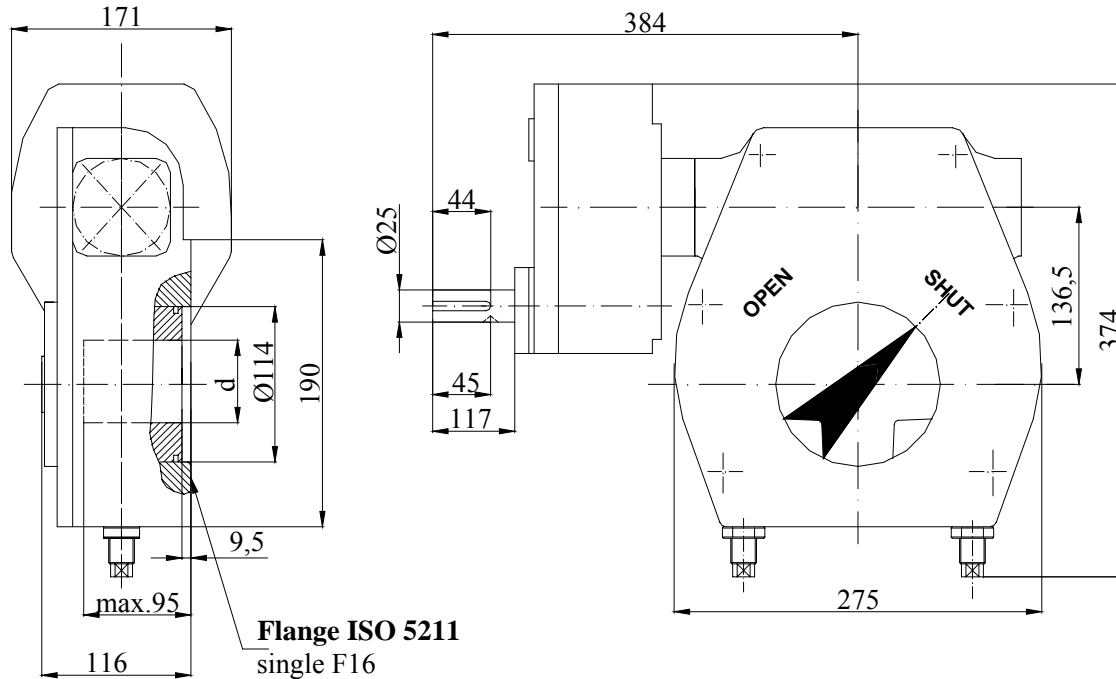
### SYMBOL :





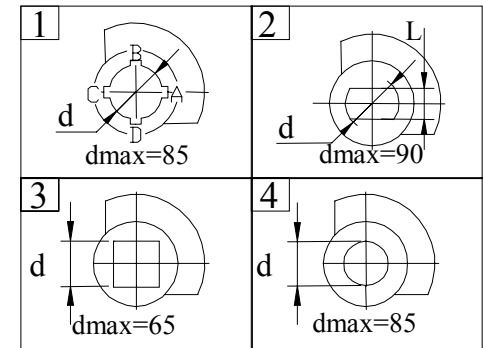
# WORM UNIT FOR ¼ TURN VALVES R2CM 345

Sheet no.	807
Date	26.03.2004



Hand wheel –ø600-standard; ø800  
Should be ordered separately !

## COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Carbon Steel	C45-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Worm bearings	-	51205 DIN 711
8	Set-screw	Carbon Steel	Gr8.8-DIN916
9	“O”ring	Nitrile	DIN 3771
10	Grease	Lithium-Calcium	UM170LiCaPb2

## TECHNICAL FEATURES:

Output rated torque[Nm].....	3450
Input rated torque[Nm].....	105 10%
Ratio.....	132
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	33

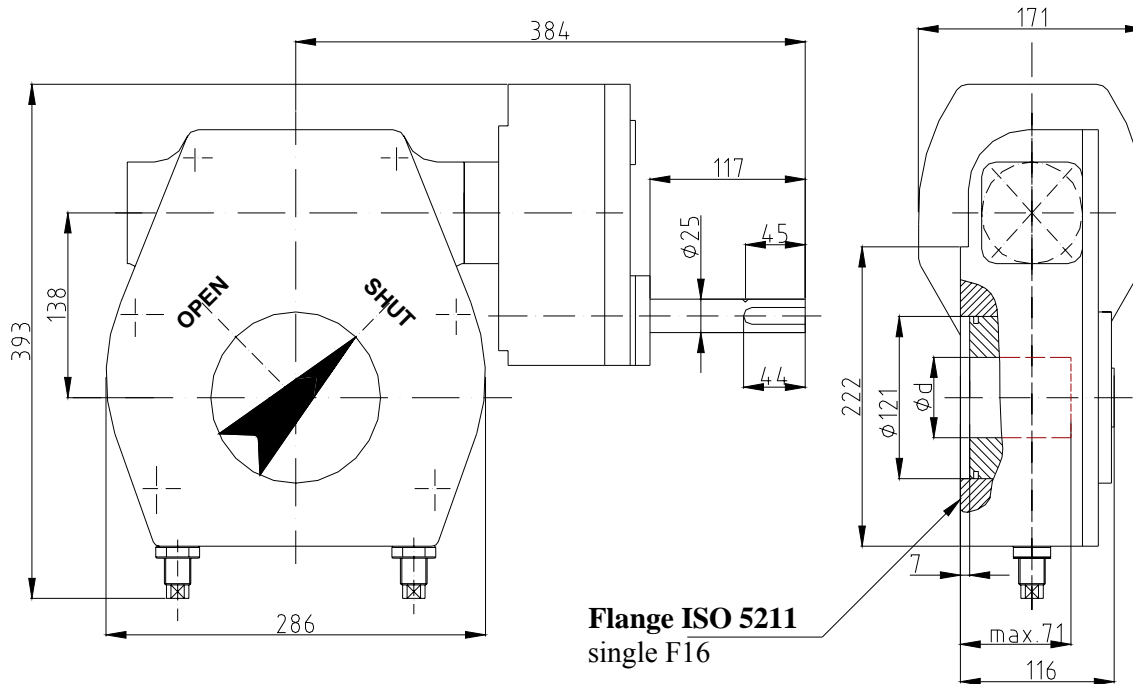
## ORDERING CODE :

**R2CM345** x **132** - **F16** / **1** / **60** / **A**

Type	Keyway position
Ratio	d-Coupling dimensions
Output flange ISO 5211	Coupling shape

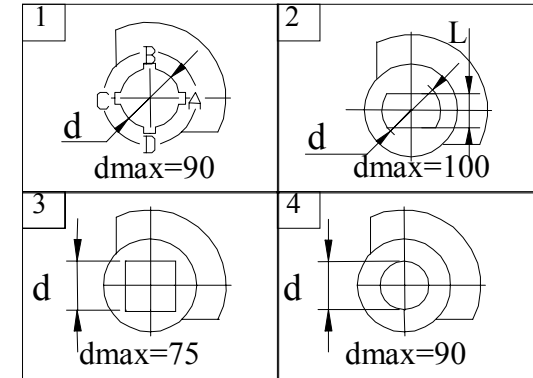
## WORM UNIT FOR ¼ TURN VALVES R2CM 425

Sheet nr.	808
Date	26.03.2004



Handwheel –ø600-standard; ø800  
*Should be ordered separately !*

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Carbon Steel	C45-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Worm bearings	-	51207 DIN 711
8	Set-screw	Carbon Steel	Gr8.8-DIN916
9	“O”ring	Nitrile	DIN 3771
10	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEARURES:

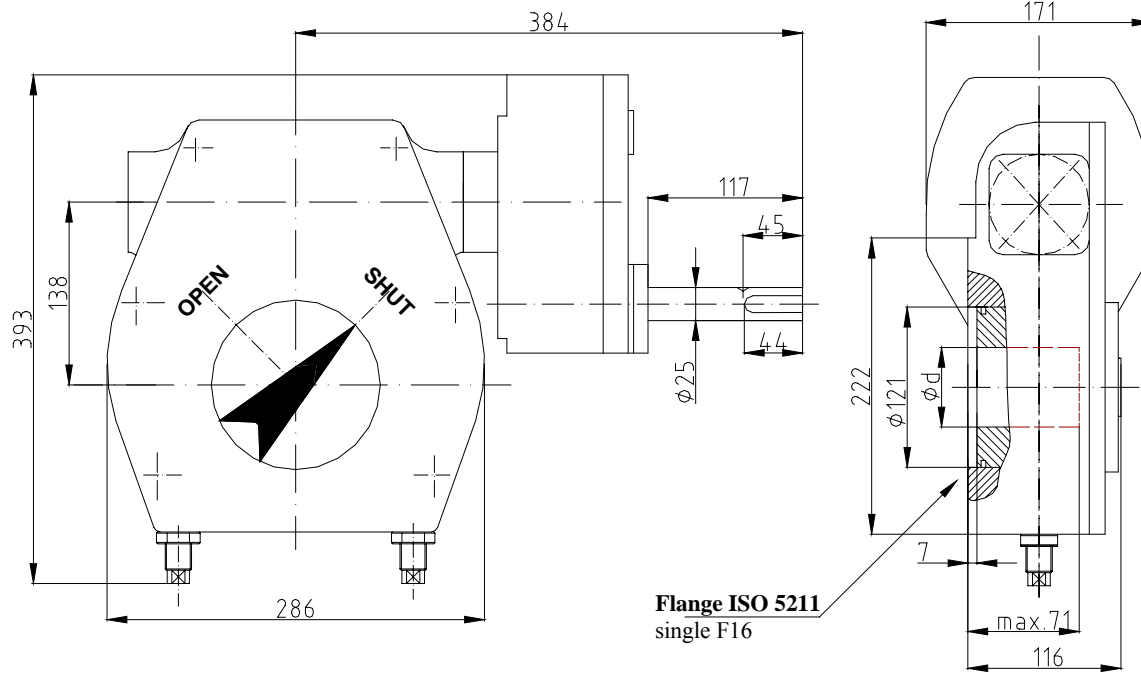
Output rated torque[Nm].....	4250
Input rated torque[Nm.....	100 ] 10%
Ratio.....	168
Output angular stroke.....	90 5
Hendweheel turns for a complet stroke.....	42
Capsulation .....	IP54

### ORDERING CODE :

**R2CM425 x 168 - F16 / 1 / 60 - A**

Type				Keywey position
Ratio				d-Coupling dimensions
Output flange ISO 5211				Coupling shape

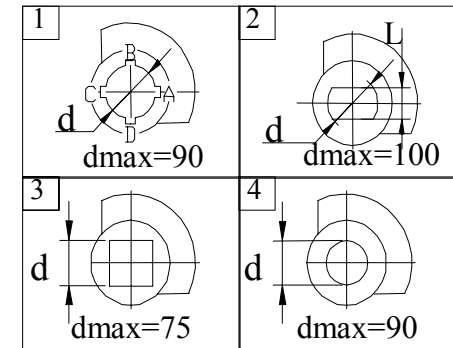
## WORM UNIT FOR ¼ TURN VALVES R2CM 540



Handwheel –ø600-standard; ø800  
Should be ordered separately !

Sheet nr.	809
Date	24.02.2004

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Carbon Steel	C45-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Worm bearings	-	51207 DIN 711
8	Set-screw	Carbon Steel	Gr8.8-DIN916
9	“O”ring	Nitrile	DIN 3771
10	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEARURES:

Output rated torque[Nm].....	5400
Input rated torque[Nm].....	100 ] 10%
Ratio.....	210
Output angular stroke.....	90 5
Hendweheel turns for a complet stroke.....	52,5
Capsulation .....	IP54

### ORDERING CODE :

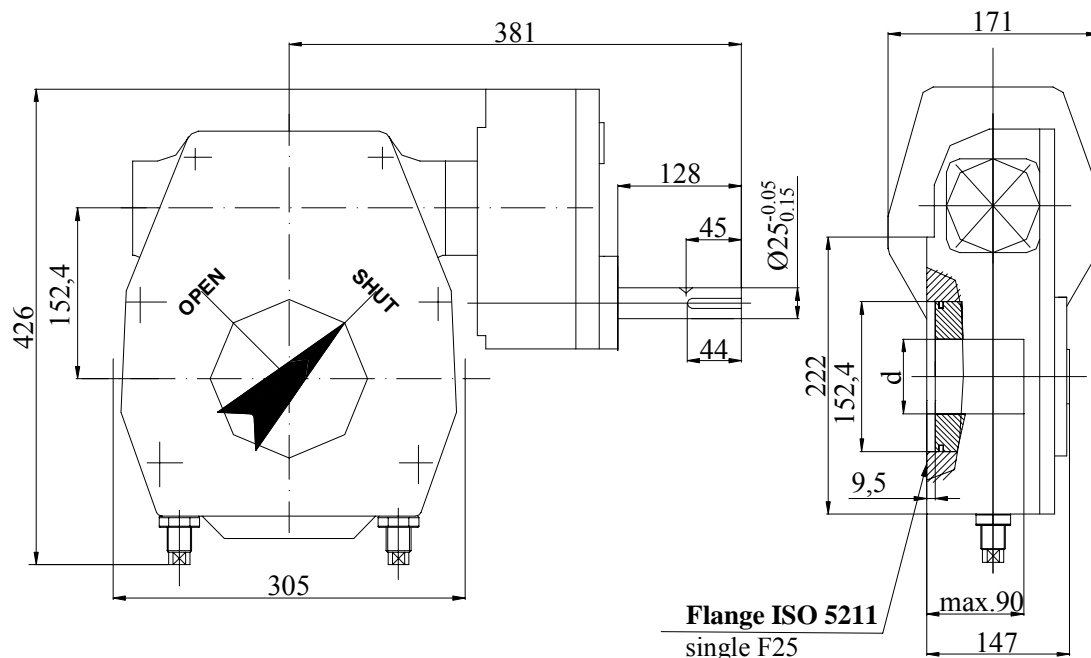
**R2CM 540** x 210 - F16 / 1 / 60 - A

Type	Keywey position
Ratio	d-Coupling dimensions
Output flange ISO 5211	Coupling shape



# WORM UNIT FOR 1/4 TURN VALVES R2CM 759

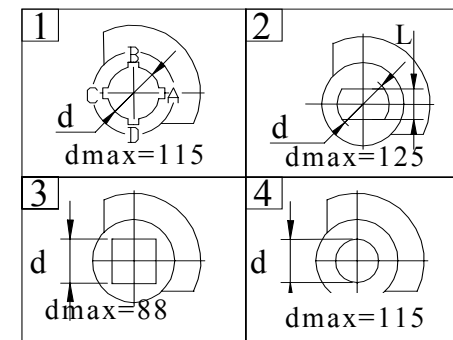
Sheet no.	810
Date	24.02.2004



**Flange ISO 5211**  
single F25

Welded handwheel-Φ450-standard :Φ600  
Should be ordered separately

## COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Carbon Steel	C45-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Brass	CuZn37-DIN17662
7	Input bearings	-	6005 DIN 625
8	Worm bearings	-	51207 DIN 711
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	"O"ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

## TECHNICAL FEATURES:

Output rated torque[Nm].....	7590
Input rated torque[Nm].....	120 10%
Ratio.....	250
Output angular stroke.....	90 5
Handwheel turns for a comoplet stroke.....	62.5
Capsulation.....	IP54

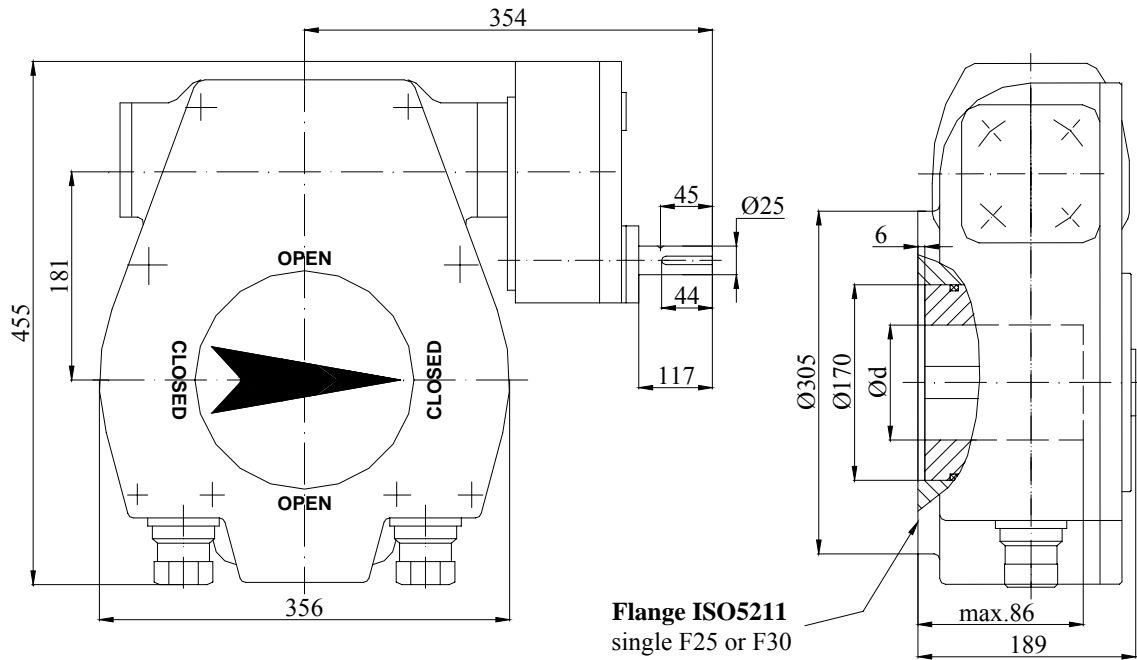
## ORDERING CODE :

**R2CM-759 x 250 - F25 / 1 / 60 - A**

Type	Ratio	Output flange ISO 5211	Keyway position
			d-Coupling dimensions
			Coupling shape

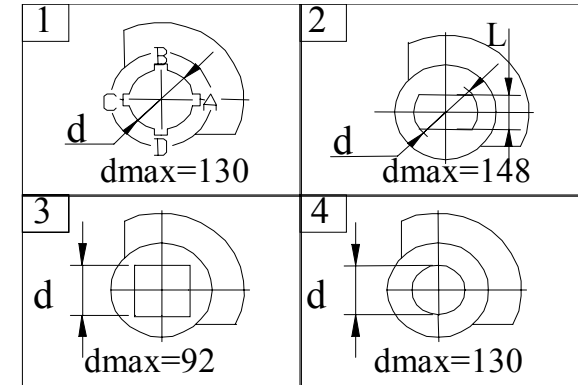
# WORM UNIT FOR ¼ TURN VALVES R2CM 897

Sheet no.	811
Date	24.02.2004



Handwheel –ø600standard ;ø800  
*Should be ordered separately*

## COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Carbon Steel	C45-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronz	CuSn6-DIN17662
7	Input bearings	-	6005-DIN625
8	Worm bearings	-	51309 DIN711
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	“O”ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

## TEHNICAL FEATURES:

Output rated torque[Nm].....	8970
Input rated torque[Nm].....	120 10%
Ratio.....	300
Output angular stroke.....	90 5
Handwheel turns for a complet stroke.....	75
Capsulation.....	IP54

## ORDERING CODE :

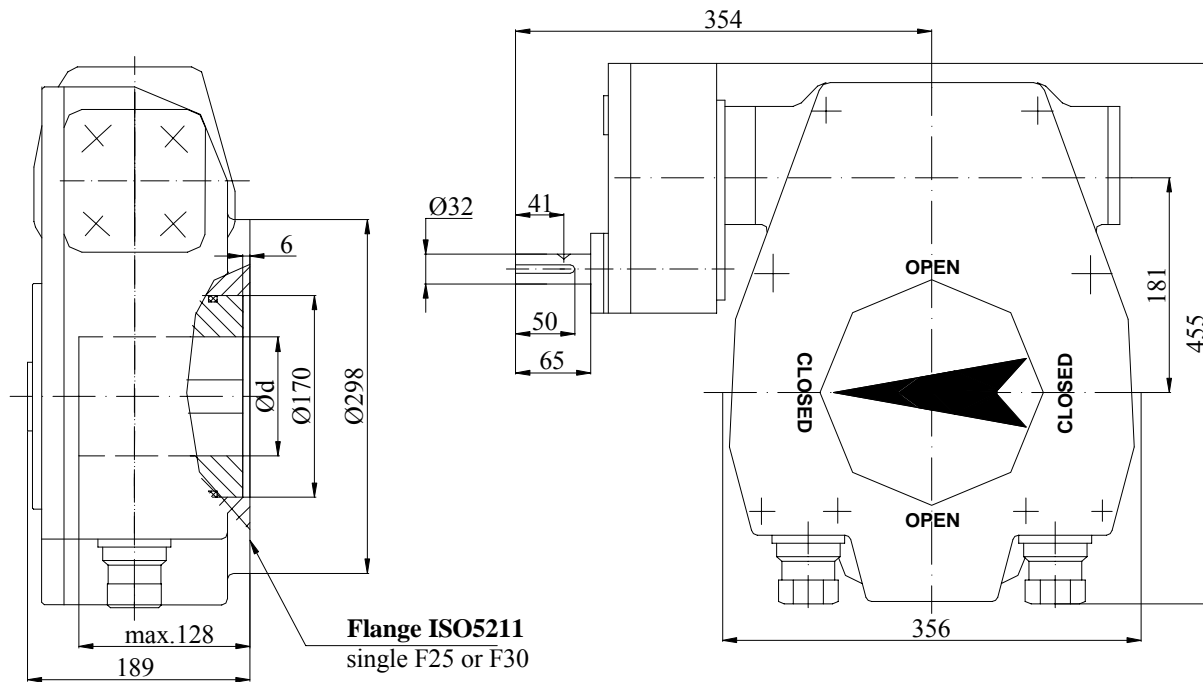
**R2CM 897 x 300 - F30 / 1 / 60 - A**

Type	Ratio	Output flange ISO 5211	Keyway position
			d- Coupling dimensions
			Coupling shape

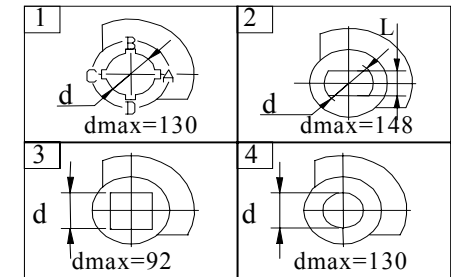


# WORM UNIT FOR 1/4 TURN VALVES R2CM 1600

Sheet no.	813
Date	24.02.2004



## COUPLING SHAPE(TOP VIEW)



Handwheel –ø600standard ;ø800  
*Should be ordered separately*

Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Carbon Steel	C45-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronz	CuSn6-DIN17662
7	Input bearings	-	6005-DIN625
8	Worm bearings	-	51309 DIN711
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	“O”ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

## TEHNICAL FEATURES:

Output rated torque[Nm].....16000  
 Input rated torque[Nm].....118/170 10%  
 Ratio.....540/369  
 Output angular stroke.....90 5  
 Handwheel turns for a complet stroke.....135/92,5  
 Capsulation.....IP54

## ORDERING CODE :

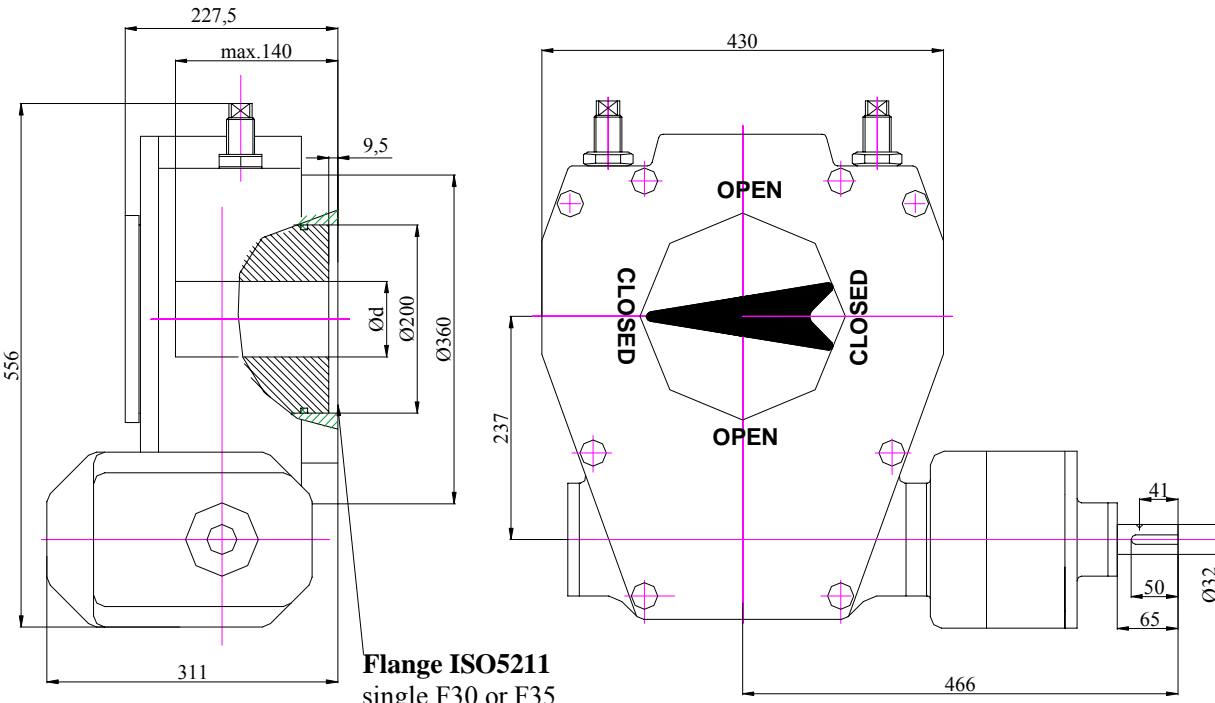
**R2CM 1600 x 369 - F30 / 1 / 60 - A**

Type	Ratio	Output flange ISO 5211	Keyway position
			d- Coupling dimensions
			Coupling shape



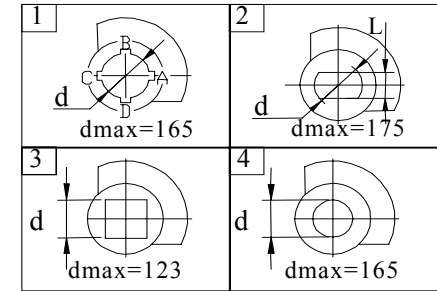
# WORM UNIT FOR 1/4 TURN VALVES R2CM 2000

Sheet no.	814
Date	24.02.2004



Handwheel -ø600standard ;ø800  
*Should be ordered separately*

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Carbon Steel	C45-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronz	CuSn6-DIN17662
7	Input bearings	-	6005-DIN625
8	Worm bearings	-	ANK6590- DIN711
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	"O"ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

### TEHNIICAL FEATURES:

- Output rated torque[Nm].....20000
- Input rated torque[Nm].....110/75 10%
- Ratio.....720/1080
- Output angular stroke.....90 5
- Handwheel turns for a complet stroke.....180/270
- Capsulation.....IP54

### ORDERING CODE :

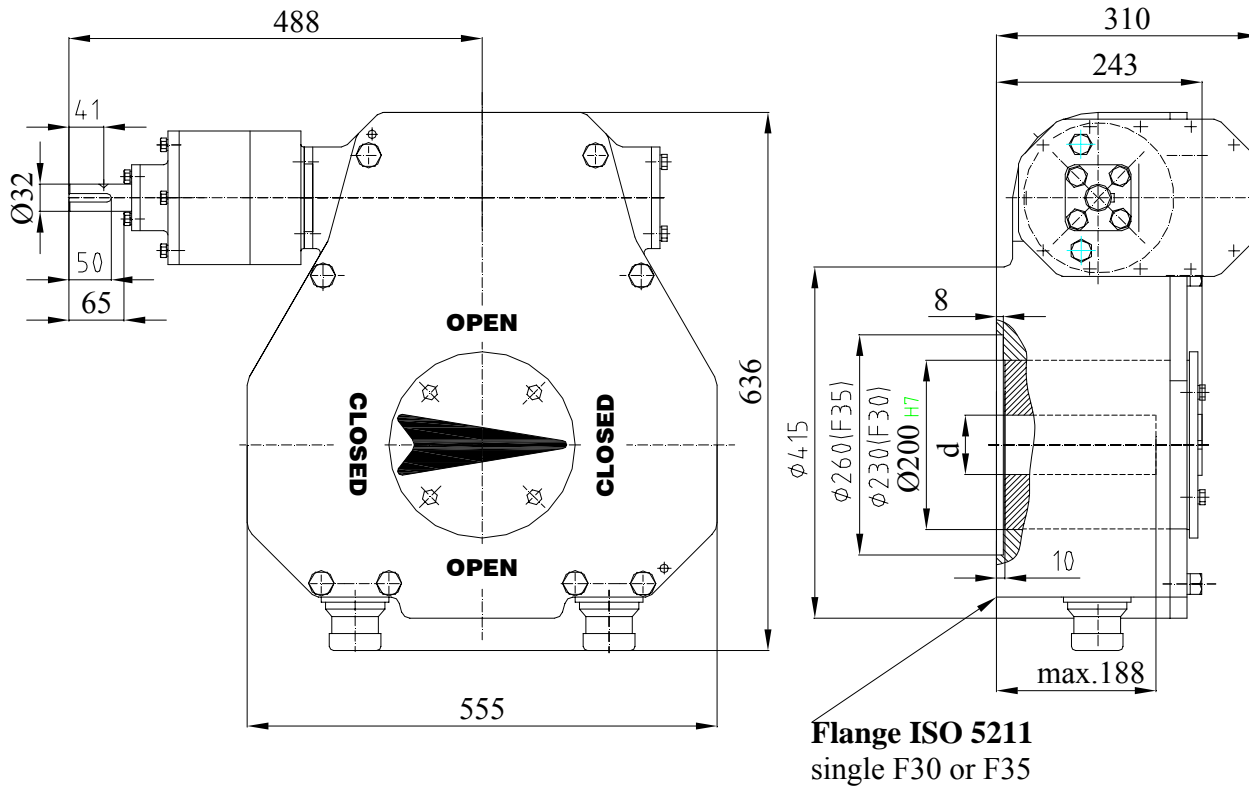
**R2CM 2000 x 720 - F30 / 1 / 60 - A**

Type					Keywey pozition
Ratio					d- Coupling dimensions
Output flange ISO 5211					Coupling shape

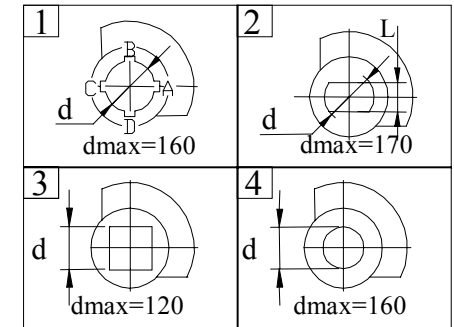


## WORM UNIT FOR ¼ TURN VALVES R2CM 3000

Sheet no.	815a
Date	24.02.2004



### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Case harden. steel	16 MnCr 5-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Input bearings	-	6007, 6306 - DIN 625
8	Worm bearings	-	81112 DIN 722
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	"O"ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

Handwheel –  $\phi 600$  – standard;  $\phi 800$   
 Should be ordered separately!

### TECHNICAL FEATURES:

Output rated torque[Nm].....	30000
Input rated torque[Nm].....	180 10%
Ratio.....	720
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	180
Capsulation.....	IP 54

### ORDERING CODE :

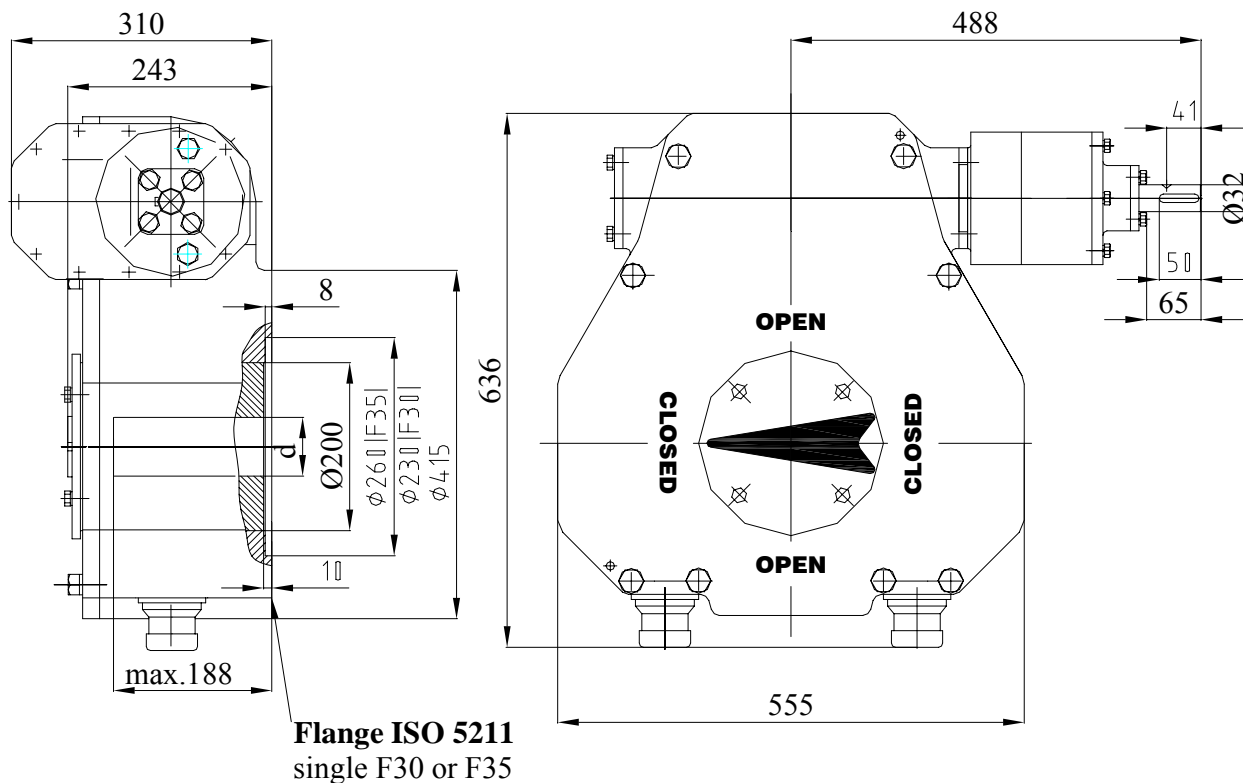
**R2CM3000 x 720 - F35 / 1 / 90 - A**

Type	Ratio	Output flange ISO 5211	Keyway position
			d-Coupling dimensions
			Coupling shape

# WORM UNIT FOR ¼ TURN VALVES R2CM 4000



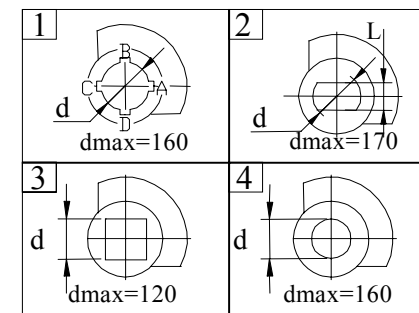
Sheet no.	816a
Date	24.02.2004



**Flange ISO 5211**  
 single F30 or F35

Handwheel – ø600 – standard; ø800  
 Should be ordered separately!

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Case harden. steel	16 MnCr 5-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Input bearings	-	6007, 6306 - DIN 625
8	Worm bearings	-	81112 DIN 722
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	“O”ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque[Nm].....	40000
Input rated torque[Nm].....	145 10%
Ratio.....	1200
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	300
Capsulation.....	IP 54

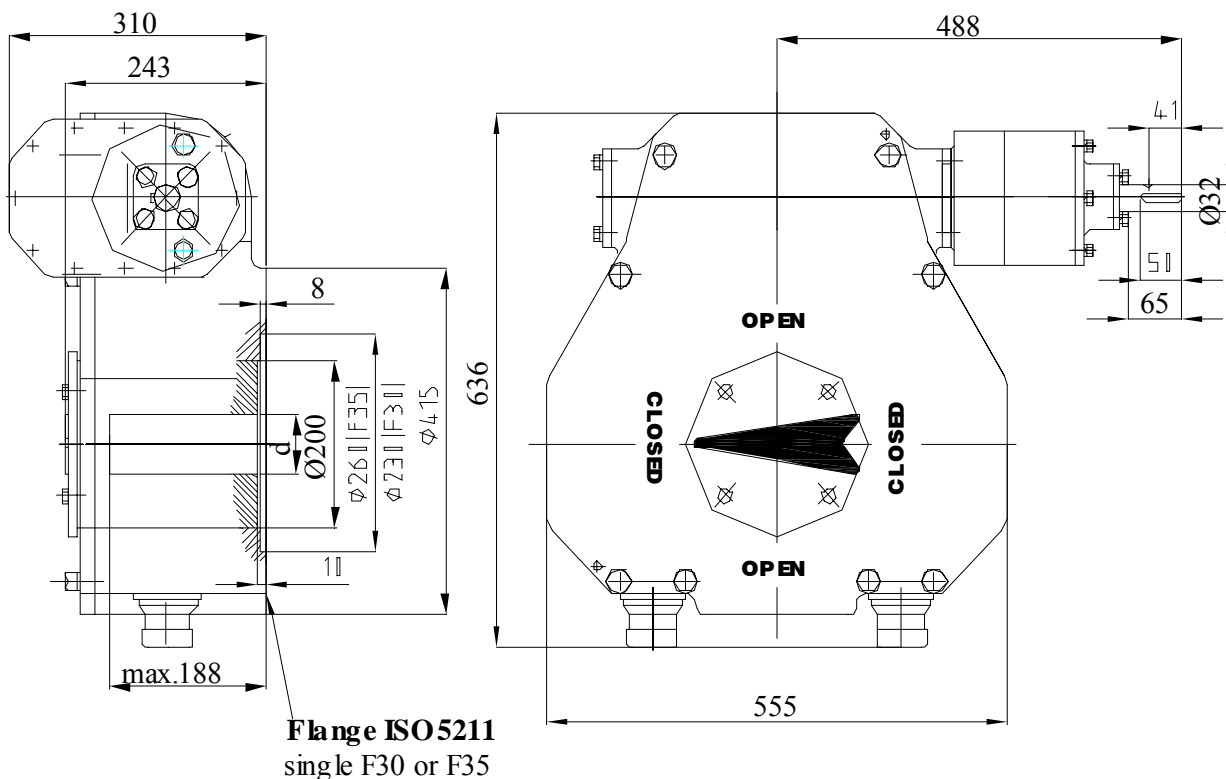
### ORDERING CODE :

**R2CM 4000 x 1200 - F35 / 1 / 90 - A**

Type	Ratio	Output flange ISO 5211	Keyway position
			d-Coupling dimensions
			Coupling shape

## WORM UNIT FOR ¼ TURN VALVES R2CM 5000

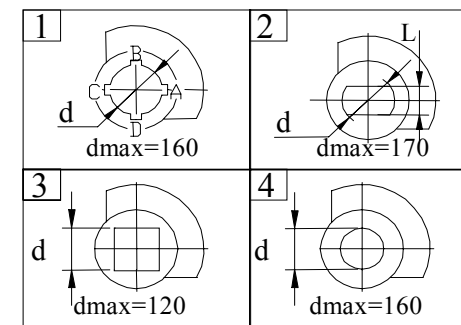
Sheet no.	817a
Date	24.02.2004



**Flange ISO 5211**  
 single F30 or F35

Handwheel – ø600 – standard; ø800  
*Should be ordered separately!*

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Case harden. steel	16 MnCr 5-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Input bearings	-	6007, 6306 - DIN 625
8	Worm bearings	-	81112 DIN 722
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	“O”ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque[Nm].....	50000
Input rated torque[Nm].....	110 10%
Ratio.....	1977
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	495
Capsulation.....	IP 54

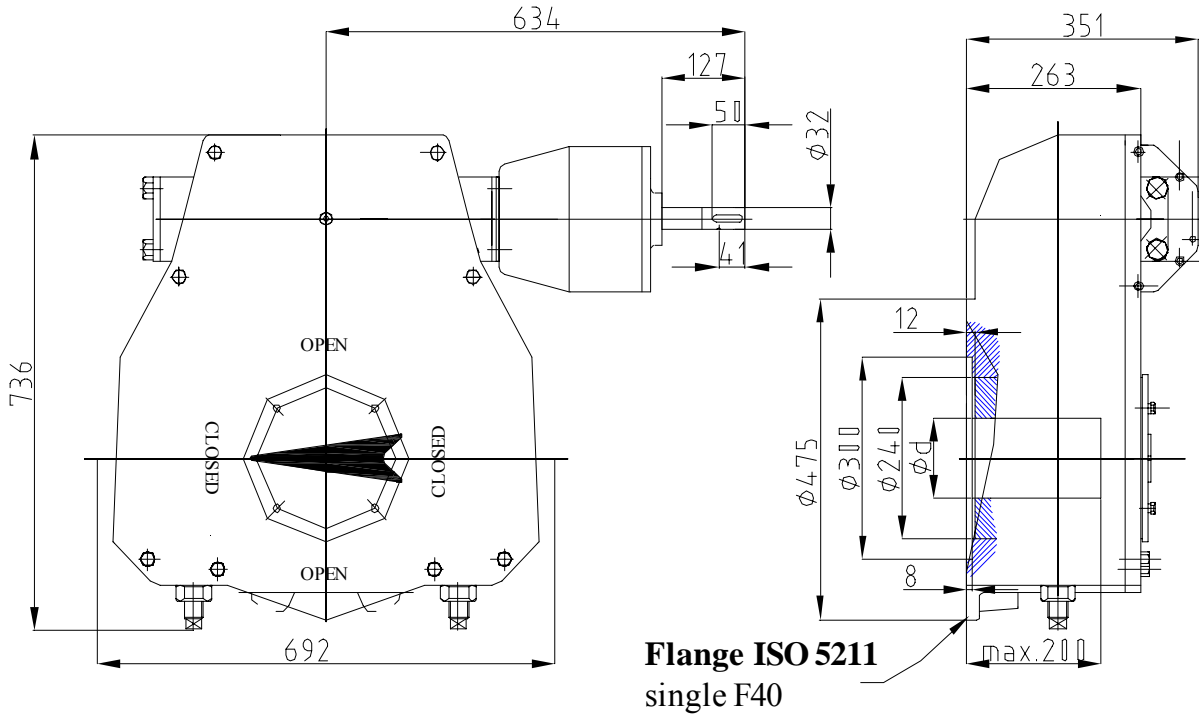
### ORDERING CODE :

**R2CM 5000 x 1977 - F35 / 1 / 90 - A**

Type	Keyway position
Ratio	d-Coupling dimensions
Output flange ISO 5211	Coupling shape



# WORM UNIT FOR ¼ TURN VALVES R2CM 6000

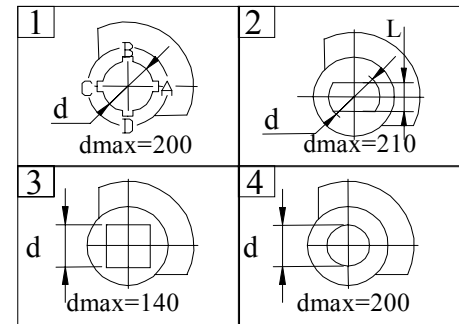


**Flange ISO 5211**  
single F40

Handwheel – ø600 – standard; ø800  
*Should be ordered separately!*

Sheet no.	818a
Date	24.02.2004

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Case harden. steel	16 MnCr 5-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Input bearings	-	6007, 6306 - DIN 625
8	Worm bearings	-	51312 DIN 722
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	“O”ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque[Nm].....	60000
Input rated torque[Nm].....	160 10%
Ratio.....	1440
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	360
Capsulation.....	IP 54

### ORDERING CODE :

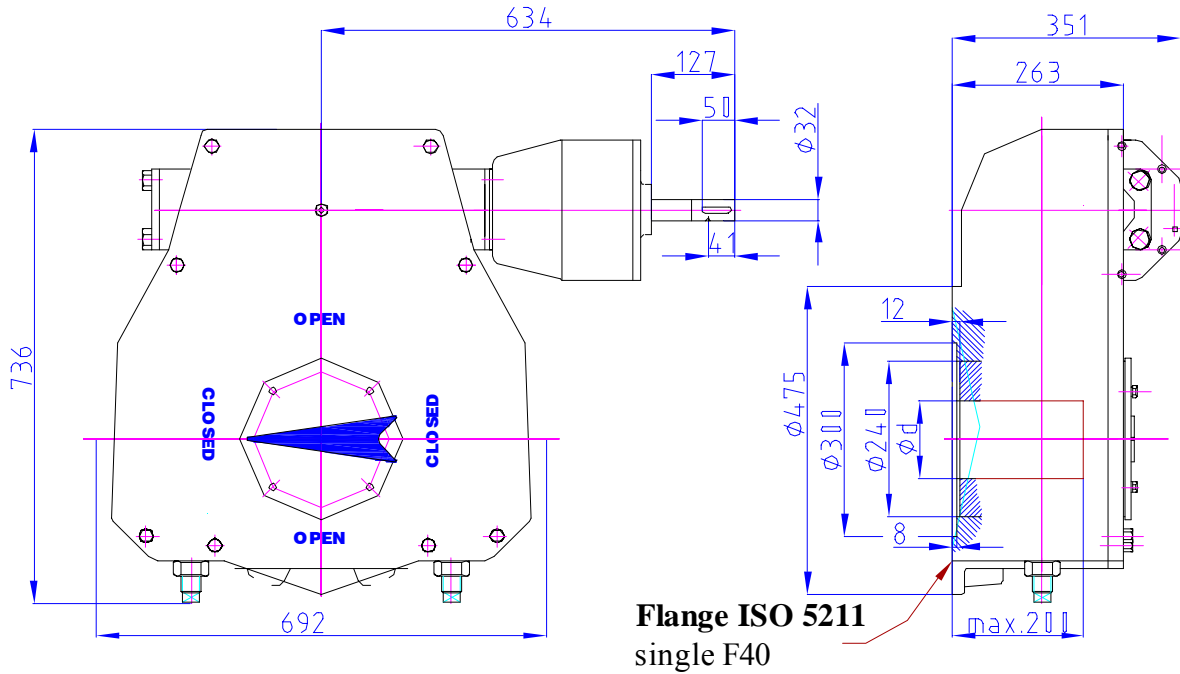
**R2CM 6000 x 1440 - F40 / 1 / 90 - A**

Type	Ratio	Output flange ISO 5211	Keyway position
			d-Coupling dimensions
			Coupling shape



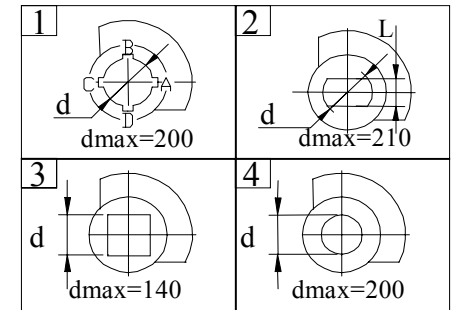
# WORM UNIT FOR ¼ TURN VALVES R2CM 6500

Sheet no.	819a
Date	24.02.2004



Handwheel – ø600 – standard; ø800  
*Should be ordered separately!*

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Case harden. steel	16 MnCr 5-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Input bearings	-	6007, 6306 - DIN 625
8	Worm bearings	-	51312 DIN 722
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	"O"ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque[Nm].....	65000
Input rated torque[Nm].....	175 10%
Ratio.....	1490
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	372,5
Capsulation.....	IP 54

### ORDERING CODE :

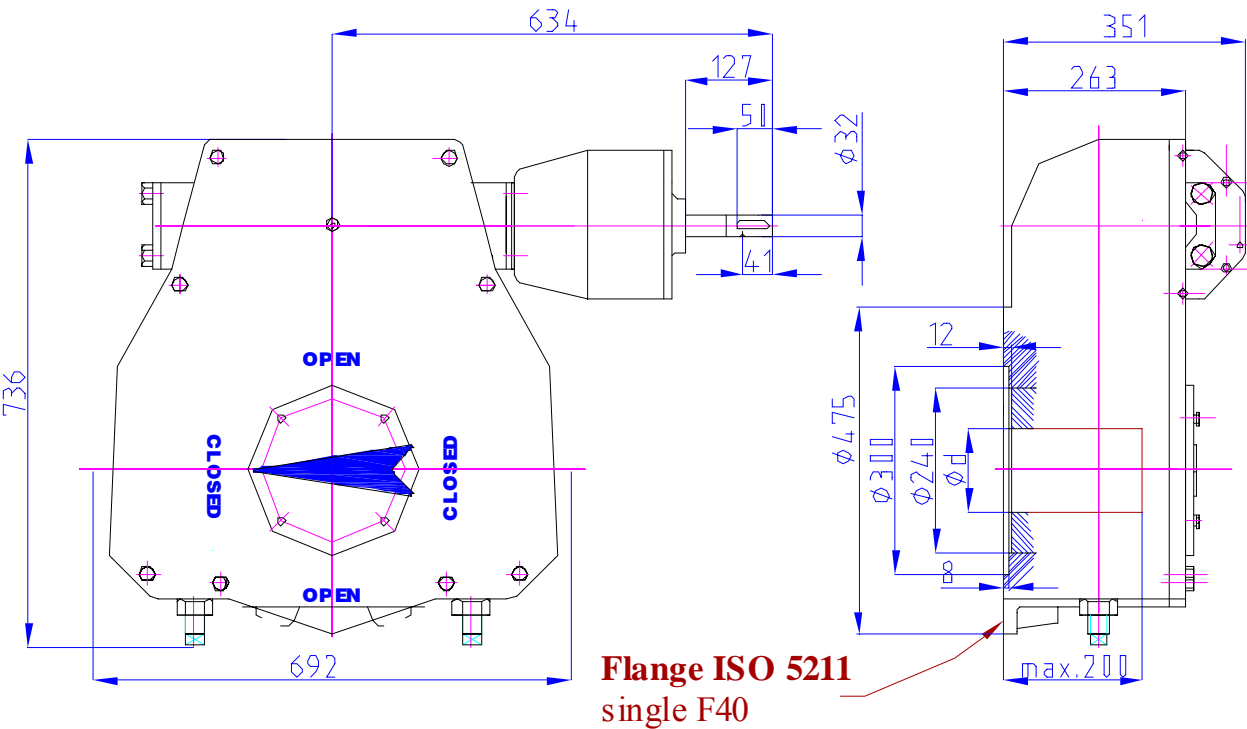
**R2CM 6500 x 1490 - F40 / 1 / 90 - A**

Type	Keyway position
Ratio	d-Coupling dimensions
Output flange ISO 5211	Coupling shape



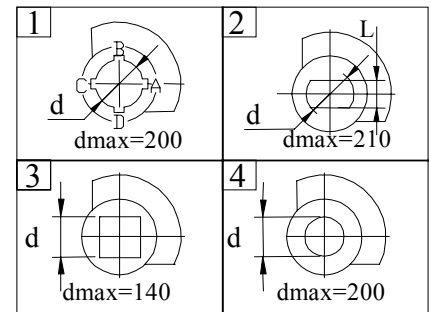
## WORM UNIT FOR ¼ TURN VALVES R2CM 8500

Sheet no.	820a
Date	24.02.2004



Handwheel – ø600 – standard; ø800  
*Should be ordered separately!*

### COUPLING SHAPE(TOP VIEW)



Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
2	Input shaft	Carbon Steel	C45-DIN17200
3	Spur gears	Carbon Steel	C45-DIN17200
4	Worm shaft	Case harden. steel	16 MnCr 5-DIN17200
5	Quadrant	Ductile Iron	GGG40-DIN1693
6	Bushing	Bronze	CuSn6-DIN17662
7	Input bearings	-	6007, 6306 - DIN 625
8	Worm bearings	-	51312 DIN 722
9	Set-screw	Carbon Steel	Gr8.8-DIN916
10	“O”ring	Nitrile	DIN 3771
11	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque[Nm].....	85000
Input rated torque[Nm].....	210/125 10%
Ratio.....	1560/2700
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	390/675
Capsulation.....	IP 54

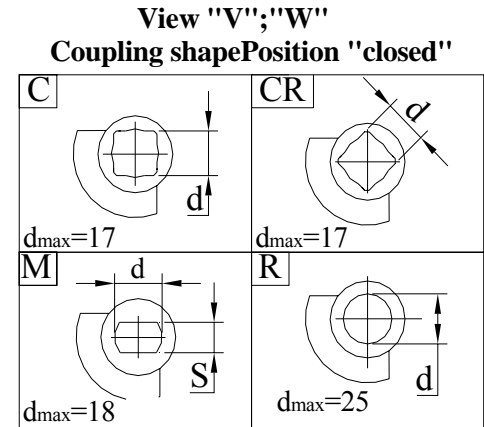
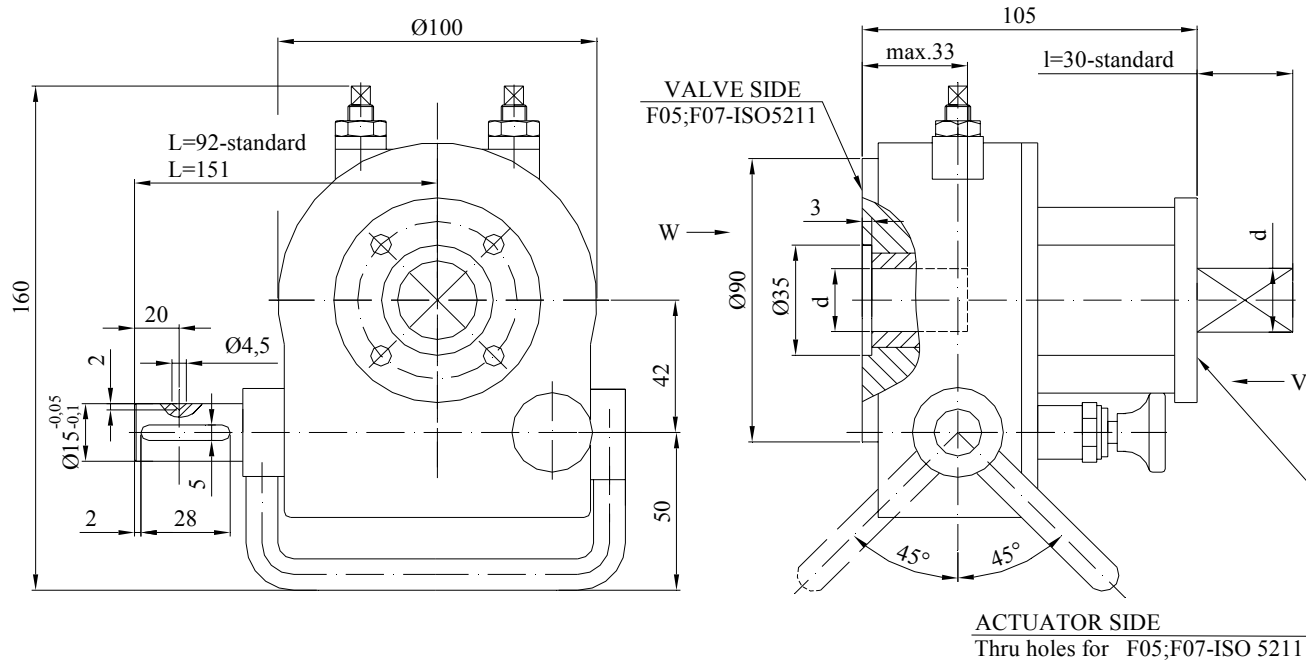
### ORDERING CODE :

**R2CM 8500 x 1560 - F40 / 1 / 90 - A**

Type	Ratio	Output flange ISO 5211	Keyway position
			Coupling dimensions code
			Coupling shape

# DECLUTCHABLE "1/4-TURN" -ACTUATOR RMD 0A

Sheet nr.	614b
Date	05.03.2003



Alluminium Handwheel - 140-standard  
Should be ordered separately

## TECHNICAL FEATURES:

Output rated torque.....125 Nm  
 Input torque.....8,8 Nm  
 Ratio.....41  
 Output angular stroke.....90 5  
 Handwheel turns for a complete stroke....10,25  
 Capsulation.....IP 65

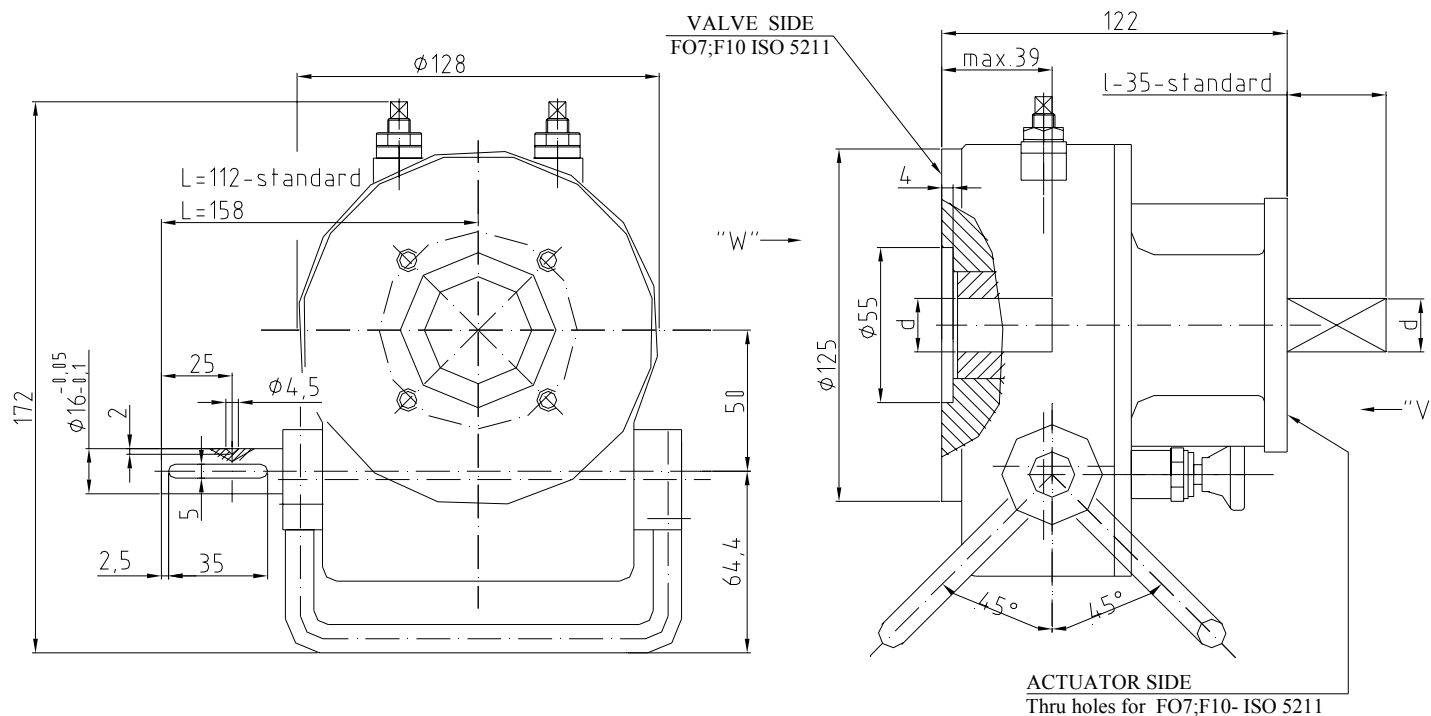
## ORDERING CODE:

**RMD-0A** x **F07** - **C15** / **F05** - **C15** x **30** - **92**

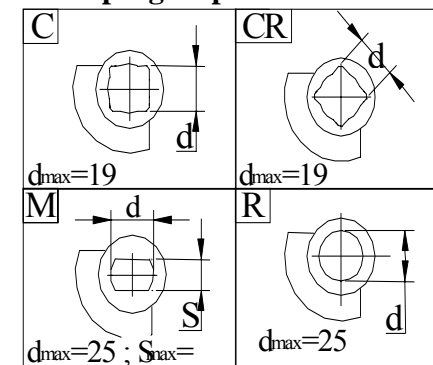
Type				L-Shaft length
Valve side ISO 5211				l-length
d-Valve coupling shape				d-Coupling shape & dim. -actuator side
				Thru holes for actuator side ISO 5211

## DECLUTCHABLE "1/4-TURN" -ACTUATOR RMD 1A

Sheet nr.	615b
Date	05.03.2003



View "V"; "W"  
Coupling shape Position "closed"



Alluminium Handweel Ø225-Standard  
 Should be ordered separately

### TECHNICAL FEATURES:

Output rated torque.....	270 Nm
Input torque.....	22,5 Nm
Ratio.....	40
Output angular stroke.....	90 5
Handwheel turns for a complete stroke.....	10
Capsulation.....	IP 65

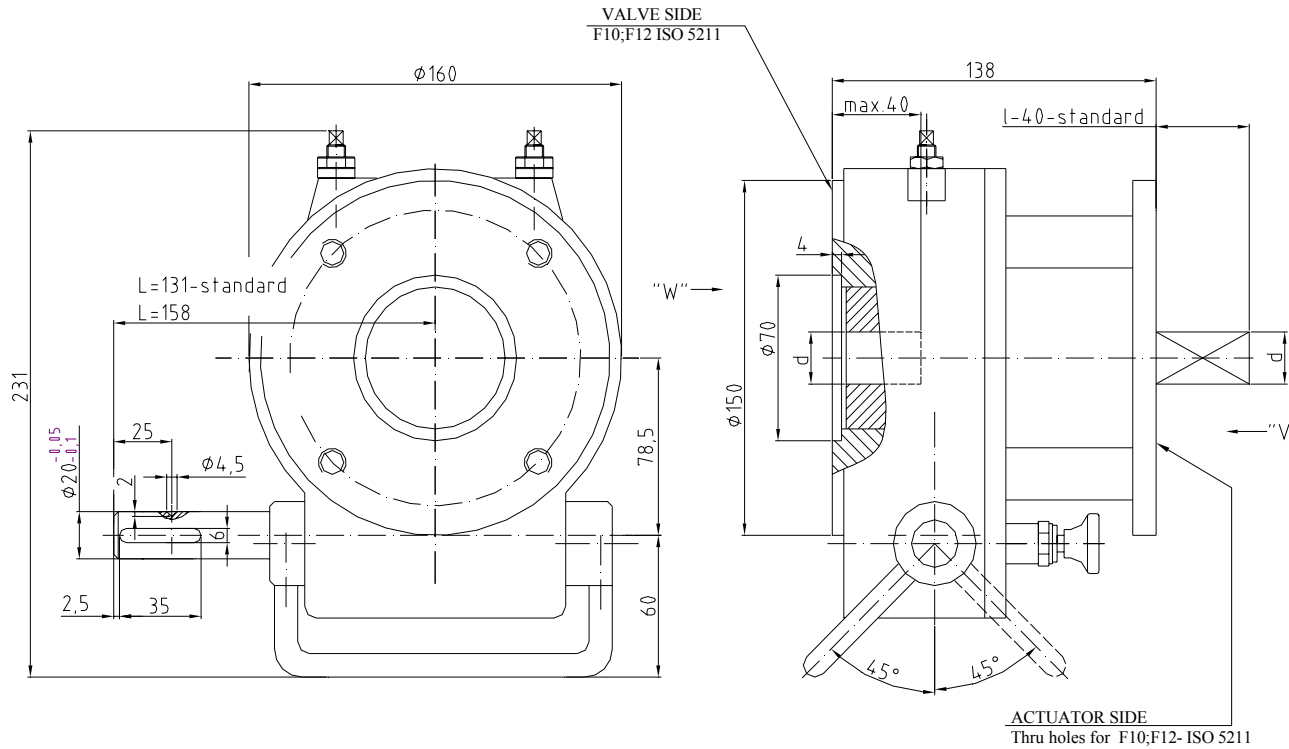
### ORDERING CODE:

<b>RMD-1A</b>	x	<b>F10</b>	-	<b>C17</b>	/	<b>F07</b>	-	<b>C17</b>	x	<b>35</b>	-	<b>112</b>
Type		Valve side ISO 5211		d-Valve coupling shape						L-Shaft length		l-length
											d-Coupling shape & dim. -actuator side	
											Thru holes for actuator side ISO 5211	

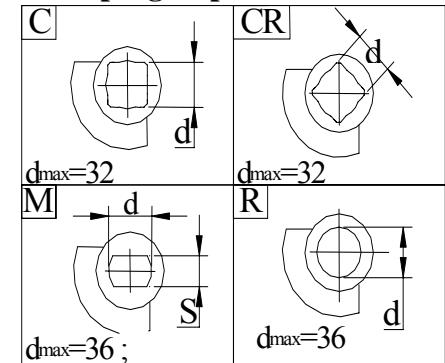
# DECLUTCHABLE "1/4-TURN" –ACTUATOR RMD 2A



Sheet nr.	616b
Date	05.03.2003



View "V";"W"  
Coupling shape Position "closed"



Alluminium Handweel Ø225-Standard  
 Should be ordered separately

## TECHNICAL FEATURES:

- Output rated torque.....800 Nm
- Input torque.....55 Nm
- Ratio.....48
- Output angular stroke.....90 5
- Handwheel turns for a complete stroke....10,25
- Capsulation.....IP 65
- Materials acc.to Specification nr.128

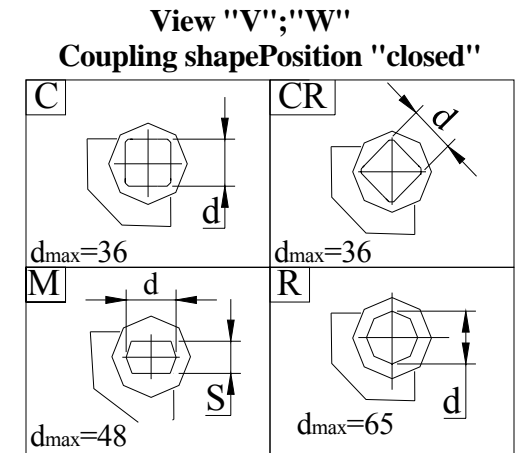
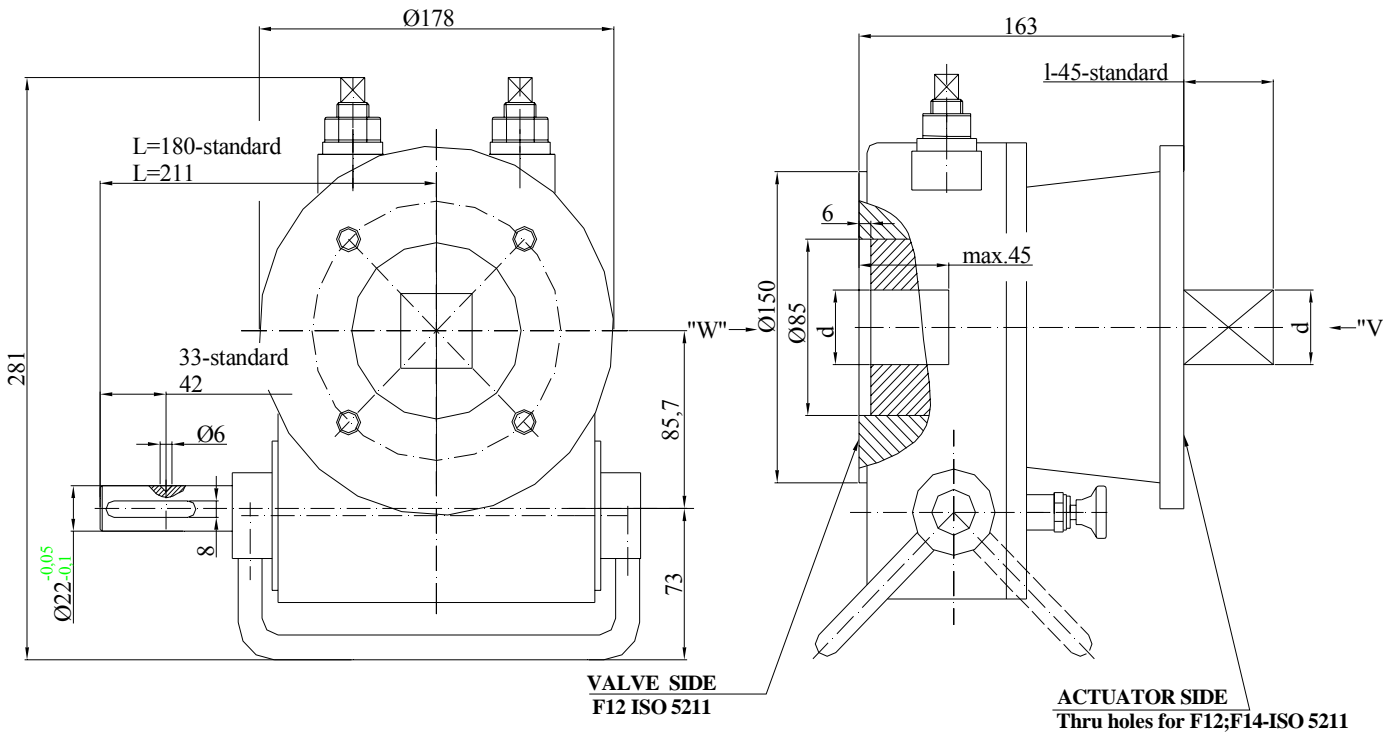
## ORDERING CODE:

<b>RMD-2A</b>	x	<b>F12</b>	-	<b>C25</b>	/	<b>F10</b>	-	<b>C25</b>	x	<b>40</b>	-	<b>131</b>
Type		Valve side ISO 5211		d-Valve coupling shape						L-Shaft length		l-length
d-Coupling shape & dim. –actuator side												
Thru holes for actuator side ISO 5211												



# DECLUTCHABLE "1/4-TURN" -ACTUATOR RMD 3A

Sheet nr.	617b
Date	05.03.2003



Hand wheel - A450-standard;  
 -A350  
 Should be ordered separately

Output rated torque.....1150 Nm  
 Input torque.....75 Nm  
 Ratio.....49  
 Output angular stroke.....90 5  
 Hand wheel turns for a complete stroke....10.25  
 Capsulation.....IP 65  
 Materials acc. to. Specification nr.128

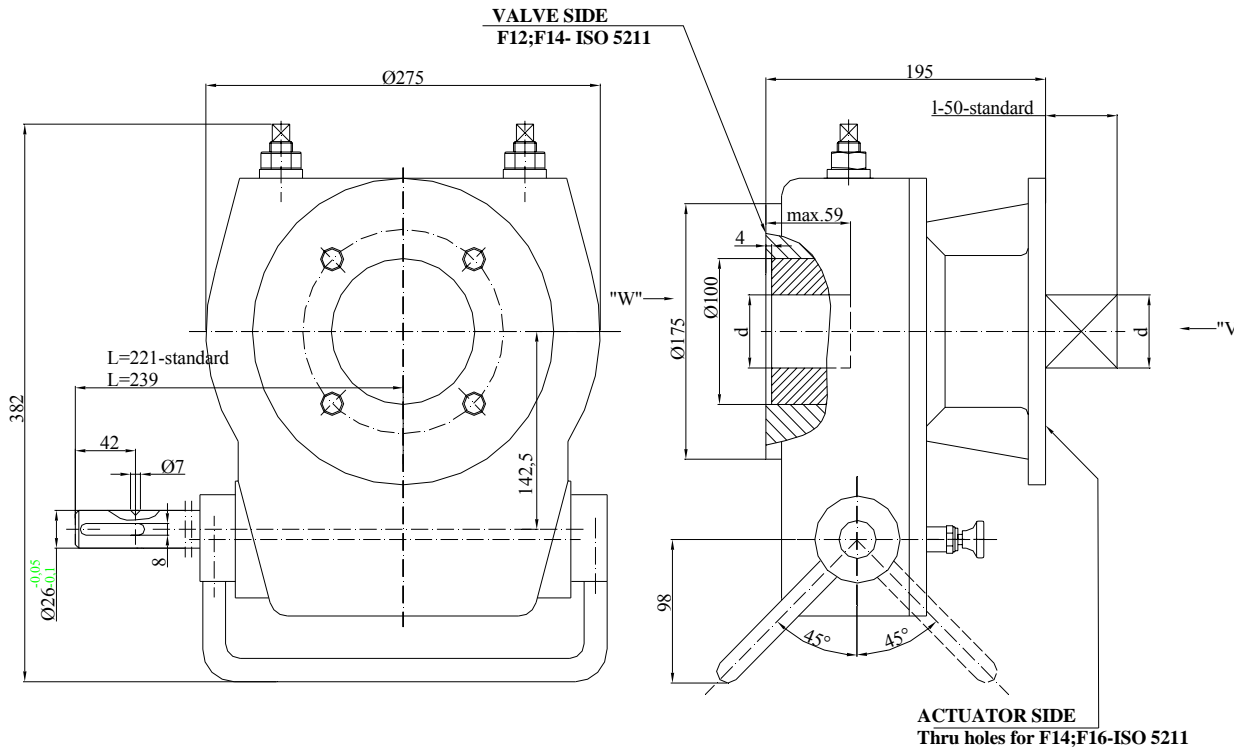
**ORDERING CODE:**

<b>RMD-3A</b>	x	<b>F12</b>	-	<b>C36</b>	/	<b>F12</b>	-	<b>C36</b>	x	<b>45</b>	-	<b>180</b>
Type		Valve side ISO 5211		d-Valve coupling shape		d-Coupling shape & dim. -actuator side		L-Shaft length		l-length		Thru holes for actuator side ISO 5211

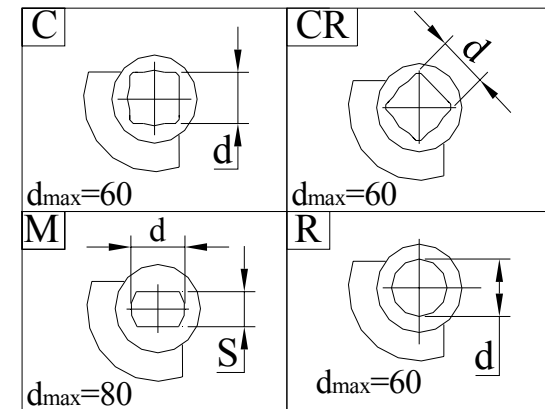


# DECLUTCHABLE "1/4-TURN" -ACTUATOR RMD 4A

Sheet nr.	618b
Date	05.03.2003



**View "V";"W"**  
Coupling shape Position "closed"



Hand wheel - A600-standard  
 Should be ordered separately

## TECHNICAL FEATURES:

- Output rated torque.....2500 Nm
- Input torque..... 190 Nm
- Ratio.....44
- Output angular stroke.....90 5
- Hand wheel turns for a complete stroke..... 11
- Capsulation.....IP 65
- Materials acc. to. Specification 128

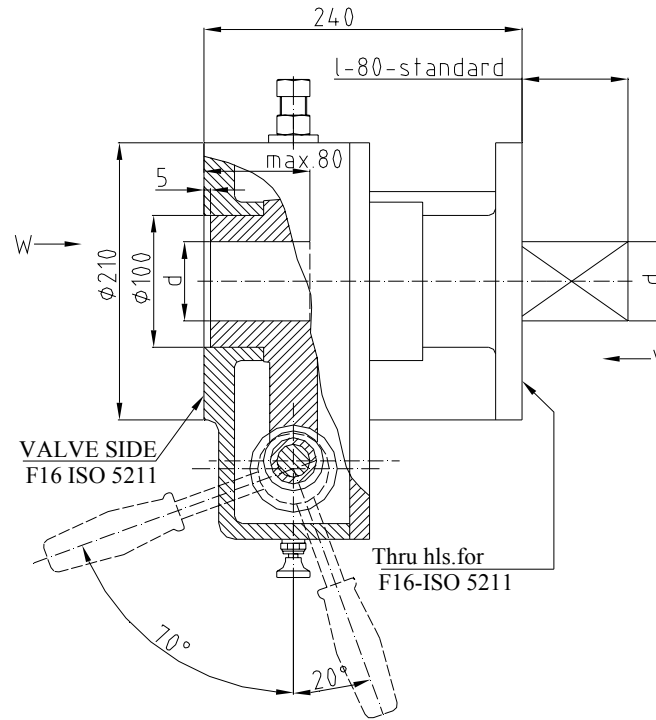
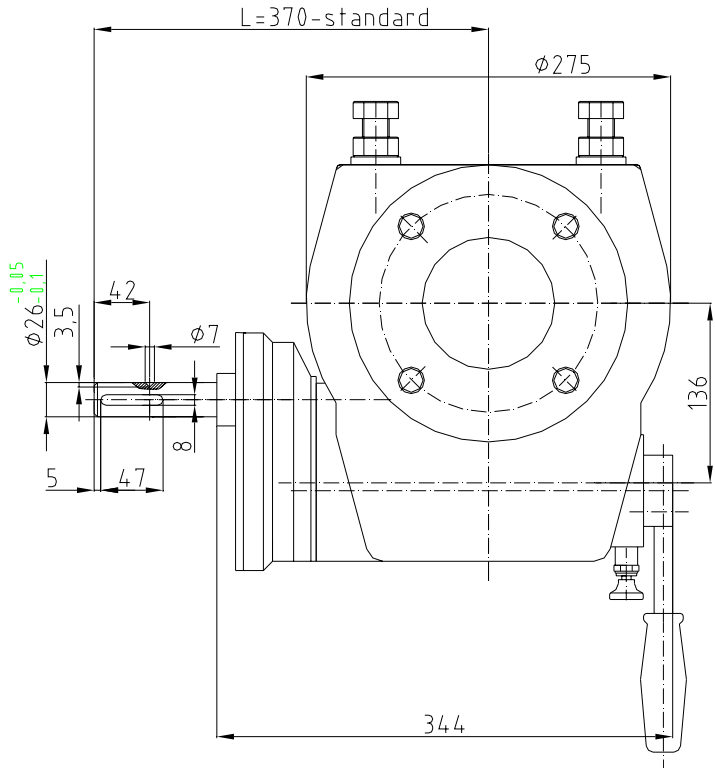
## ORDERING CODE:

<b>RMD-4A</b>	x	<b>F14</b>	-	<b>C50</b>	/	<b>F14</b>	-	<b>C50</b>	x	<b>55</b>	-	<b>221</b>
Type										L-Shaft length		
Valve side ISO 5211										l-length		
d-Valve coupling shape										d-Coupling shape & dim. -actuator side		
										Thru holes for actuator side ISO 5211		

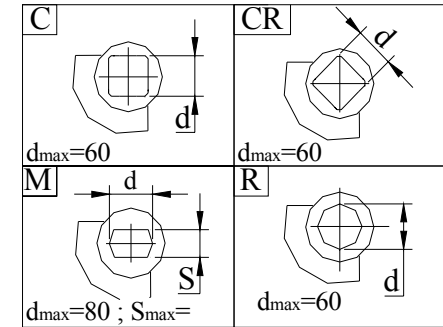


# DECLUTCHABLE "1/4-TURN" –ACTUATOR RMD 5

Sheet nr.	619b
Date	05.03.2003



View "V";"W"  
 Coupling shapePosition "closed"



Handwheel - A600  
 Should be ordered separately

## TECHNICAL FEATURES:

- Output rated torque.....4000 Nm
- Input torque..... 104 Nm
- Ratio.....127,9
- Output angular stroke.....90 5
- Handwheel turns for a complete stroke....10.25
- Capsulation.....IP 65

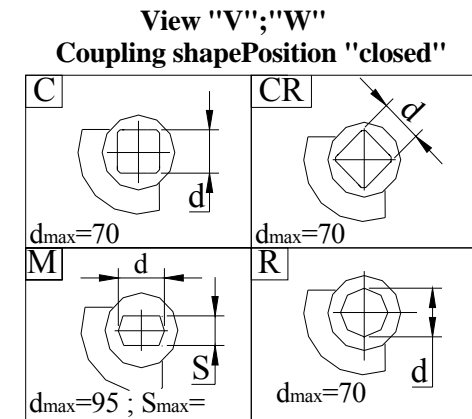
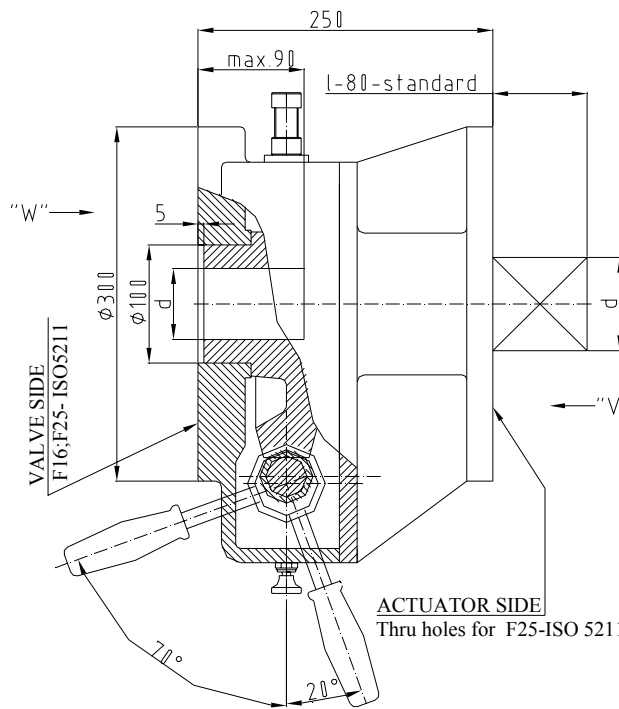
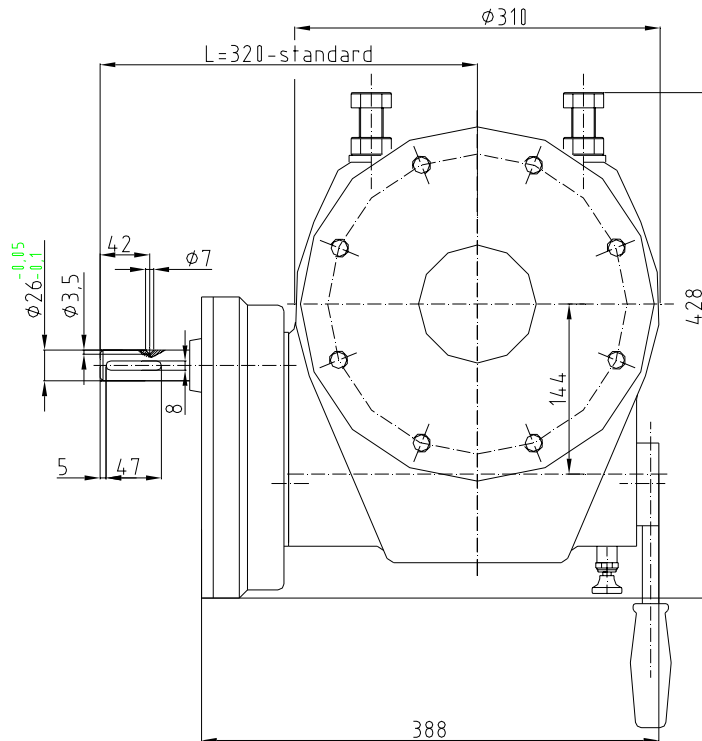
## ORDERING CODE:

<b>RMD-5</b>	x	<b>F16</b>	-	<b>C60</b>	/	<b>F16</b>	-	<b>C60</b>	x	<b>80</b>	-	<b>370</b>
Type		Valve side ISO 5211		d-Valve coupling shape		d-Coupling shape & dim. –actuator side		Thru hls. for actuator side ISO 5211		L-Shaft length		l-length

# DECLUTCHABLE "1/4-TURN" -ACTUATOR RMD 6



Sheet nr.	620b
Date	05.03.2003



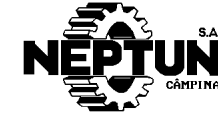
Handwheel - A600  
 Should be ordered separately

### TECHNICAL FEATURES:

- Output rated torque.....8000 Nm
- Input torque..... 144 Nm
- Ratio.....216
- Output angular stroke.....90 5
- Handwheel turns for a complete stroke....10,25
- Capsulation.....IP 65

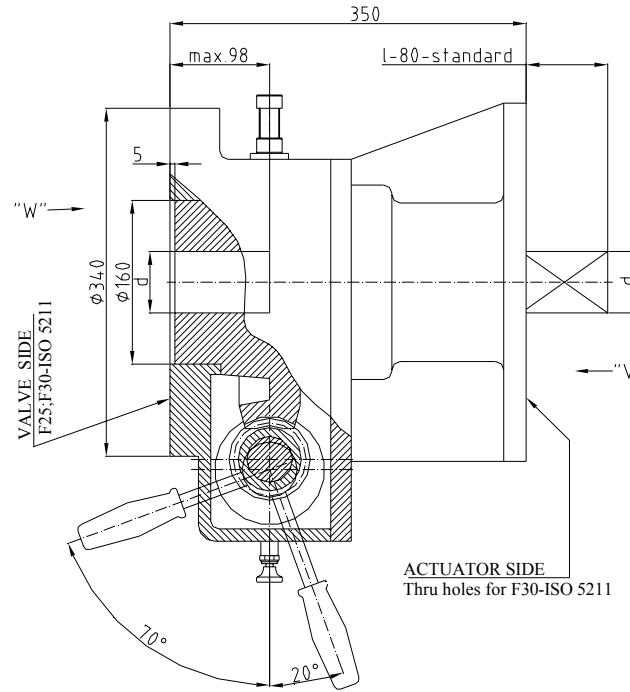
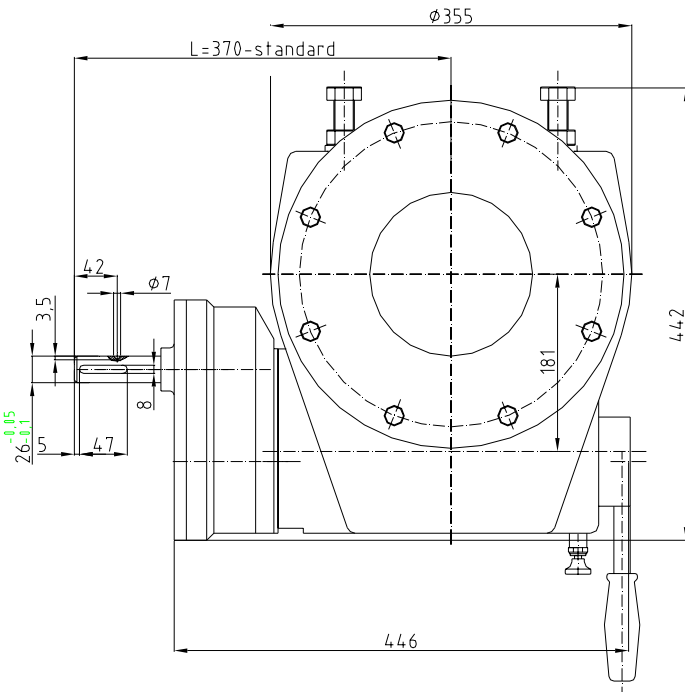
### ORDERING CODE:

<b>RMD-6</b>	x	<b>F25</b>	-	<b>C70</b>	/	<b>F25</b>	-	<b>C70</b>	x	<b>80</b>	-	<b>320</b>
Type		Valve side ISO 5211		d-Valve coupling shape						L-Shaft length		I-length
d-Coupling shape & dim. -actuator side												
Thru holes for actuator side ISO 5211												

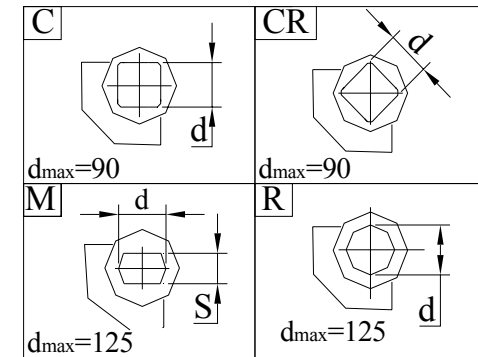


# DECLUTCHABLE "1/4-TURN" -ACTUATOR RMD 7

Sheet nr.	621b
Date	05.03.2003



View "V";"W"  
 Coupling shapePosition "closed"



Handwheel - A800  
 Should be ordered separately

## TECHNICAL FEATURES:

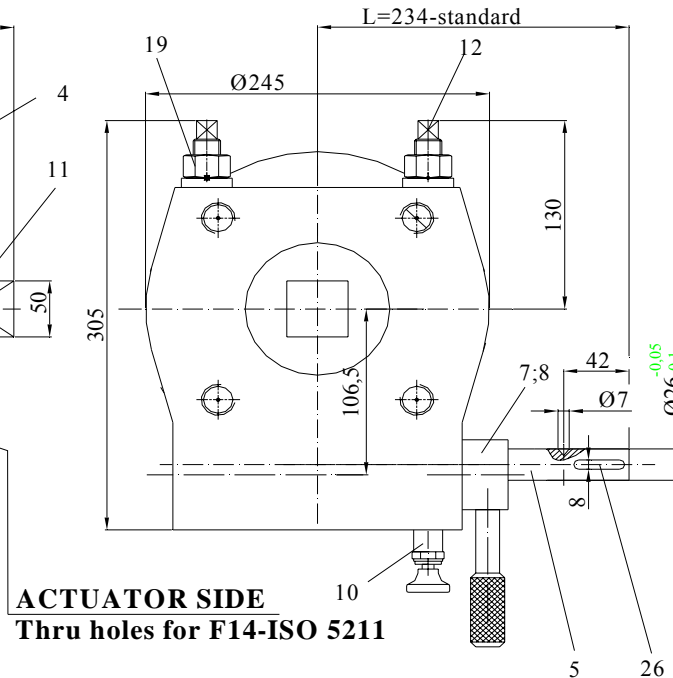
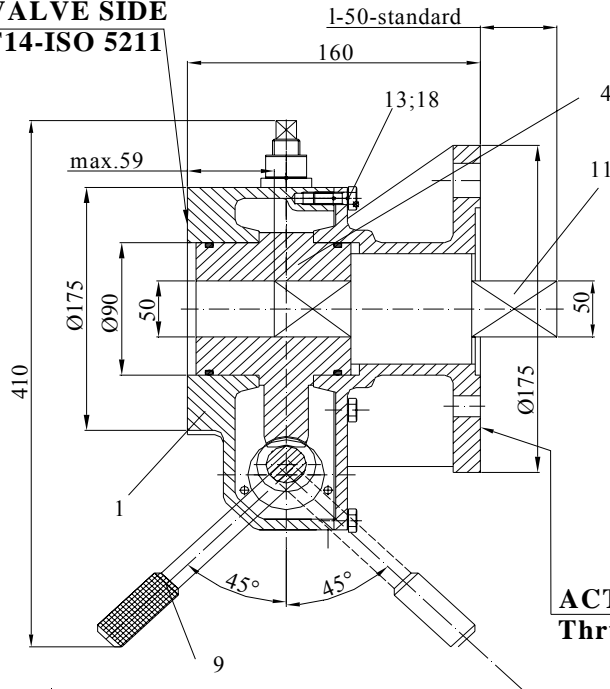
Output rated torque.....16000 Nm  
 Input torque.....163 Nm  
 Ratio.....379,5  
 Output angular stroke.....90 5  
 Handwheel turns for a complete stroke....10,25  
 Capsulation.....IP 65

## ORDERING CODE:

<b>RMD-7</b>	x	<b>F30</b>	-	<b>C70</b>	/	<b>F30</b>	-	<b>C70</b>	x	<b>80</b>	-	<b>370</b>
Type												L-Shaft length
Valve side ISO 5211												l-length
d-Valve coupling shape												d-Coupling shape & dim. -actuator side
												Thru holes for actuator side ISO 5211

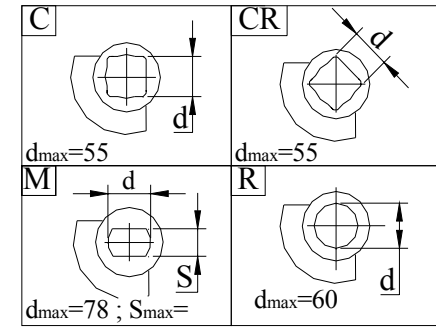
## DECLUTCHABLE "1/4-TURN" -ACTUATOR RMD 125M

**VALVE SIDE**  
**F14-ISO 5211**



Sheet nr.	466b
Date	01.09.2006

**View "V"; "W"**  
**Coupling shape Position "closed"**



Aluminum hand wheel –ø350-standard  
 Should be ordered separately!

### TECHNICAL FEATURES:

Output rated torque.....	2500 Nm
Input torque.....	110 Nm
Ratio.....	76
Output angular stroke.....	90 5
Hand wheel turns for a complete stroke.....	19

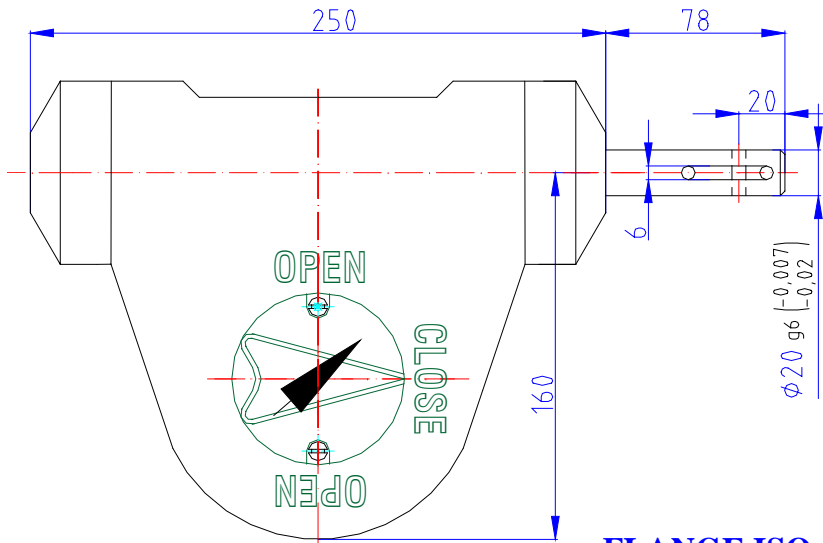
### ORDERING CODE:

<b>RMD125M</b>	x	<b>F14</b>	-	<b>C50</b>	/	<b>F14</b>	-	<b>C50</b>	x	<b>55</b>	-	<b>234</b>
Type		Valve side ISO 5211		d-Valve coupling shape		L-Shaft length		I-length		d-Coupling shape & dim. –actuator side		Thru holes for actuator side ISO 5211

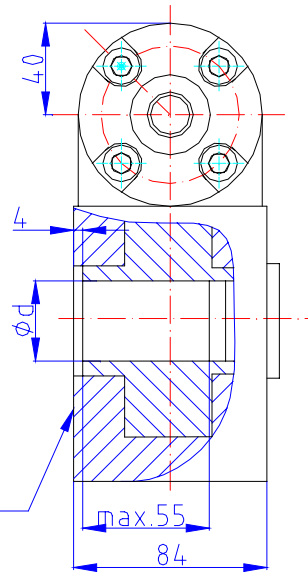
Nr	Description	Material	Specification
1	Housings	Cast iron	GG-25-DIN 1691
4	Quadrant	Ductile Iron	GGG40-DIN1693
5	Input shaft	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
7	Sleeves	Bronze-CuSn 6	DIN 17662
8	Bushing	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
9	Lever	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
10	Locking screw	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
11	Driver	<b>Stainless Steel</b>	<b>X20Cr13-DIN 17440</b>
12	Set screws	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
13	Pin	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
18	Screw	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
19	Nut	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
21	Grease	Lithium-Calcium	UM170LiCaPb2
26	Parallel key	<b>Stainless Steel A4</b>	<b>X5CrNiMo17-12-2/AISI 316</b>
	Input bearings	-	51205-DIN 625
	"O" ring	Nitrile-DIN 3771	Nitrile-DIN 3771

# TOGGLE GEAR ACTUATOR AV 2

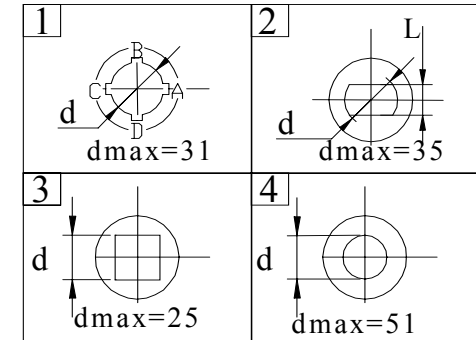
Sheet nr.	840
Date	30.04.2004



**FLANGE ISO 5211**  
 single F07 or F10  
 duple F07+F10



### COUPLING SHAPE(TOP VIEW)



Aluminum hand wheel –ø225-standard  
 Should be ordered separately!

Nr	Description	Material	Specification
1	Housing	Ductile Iron	GGG25-DIN1693
2	Input shaft	Carbon Steel	C45DIN17200
3	Cranking bar	Carbon Steel	C45DIN17200
4	Bushing	Synthered Alloy	GG45-DIN
5	Set-screw	Carbon Steel	Gr5.8-DIN916
6	“O” ring	Nitrile	DIN 3771
7	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque.....max.500 Nm  
 Input rated torque.....50 10% Nm  
 Ratio.....80  
 Output angular stroke.....90 5  
 Hand wheel turns for a complete stroke.....20  
 Capsulation.....IP 54

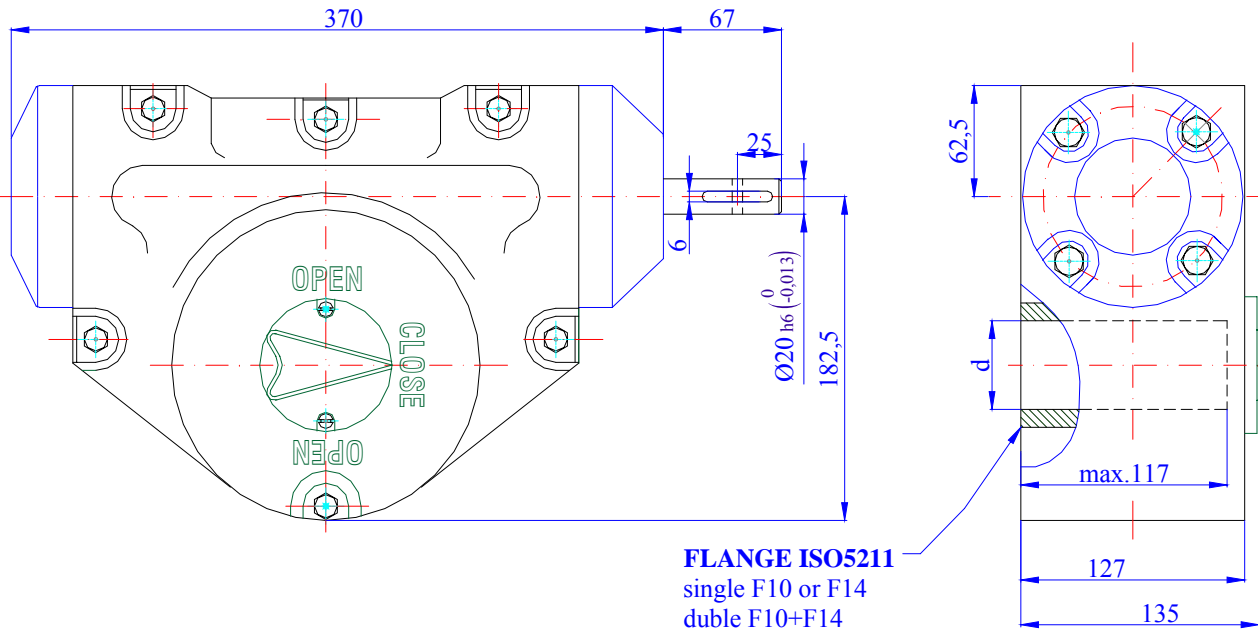
### ORDERING CODE :

**AV 2 x 80 - F10 / 3 / 24**

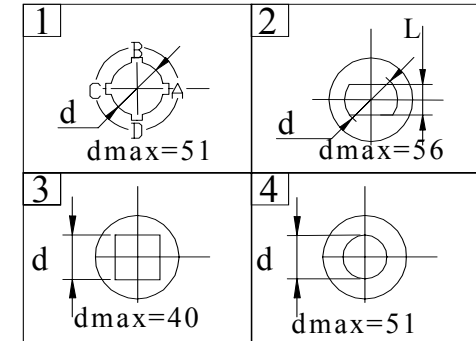
Type	Ratio	Output flange ISO 5211	Coupling shape
			d-Coupling dimensions(NCI 30)

# TOGGLE GEAR ACTUATOR AV 3

Sheet nr.	841
Date	30.04.2004



### COUPLING SHAPE(TOP VIEW)



Aluminum hand wheel –ø350-standard  
 Should be ordered separately!

Nr	Description	Material	Specification
1	Housing	Ductile Iron	GGG25-DIN1693
2	Input shaft	Carbon Steel	C45DIN17200
3	Cranking bar	Carbon Steel	C45DIN17200
4	Bushing	Synthered Alloy	GG45-DIN
5	Set-screw	Carbon Steel	Gr5.8-DIN916
6	“O” ring	Nitrile	DIN 3771
7	Grease	Lithium-Calcium	UM170LiCaPb2

### TECHNICAL FEATURES:

Output rated torque.....max.2000 Nm  
 Input rated torque.....40 10% Nm  
 Ratio.....156  
 Output angular stroke.....90 5  
 Handwheel turns for a complete stroke.....34  
 Capsulation.....IP 54

### ORDERING CODE :

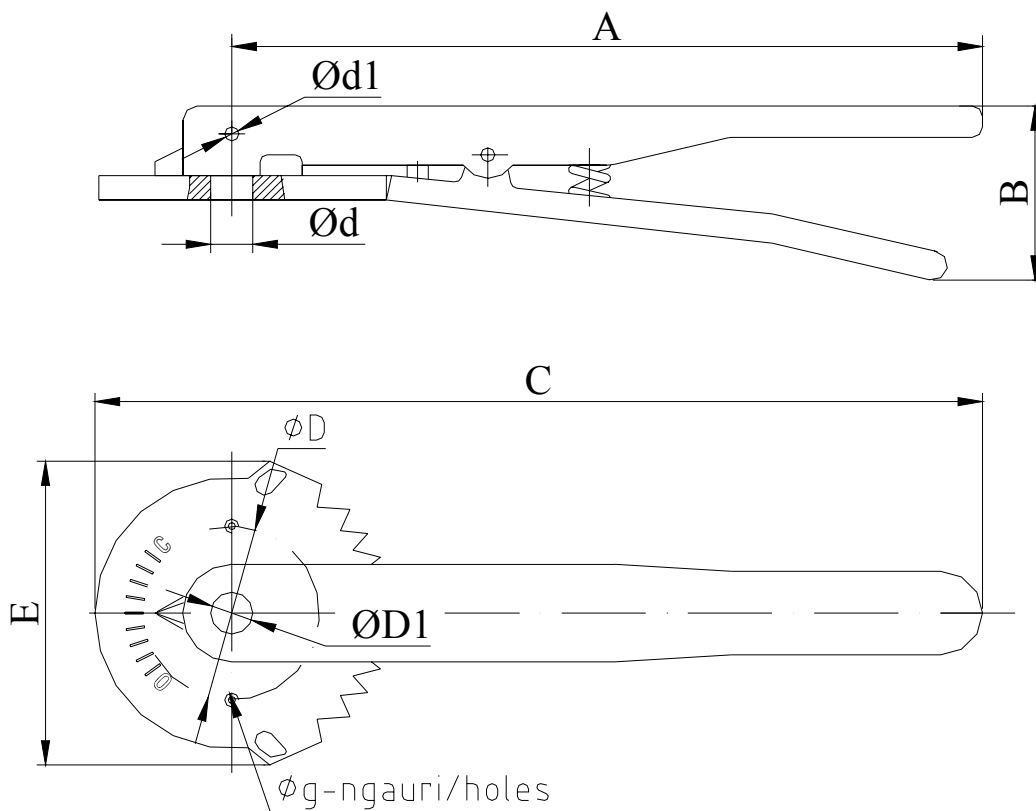
**AV 3 x 156 - F10 / 3 / 24**

Type			
Ratio			
Output flange ISO 5211			<b>d-Coupling dimensions</b>
			Coupling shape

# LOCKABLE ACTUATING LEVER FOR PART-TURN VALVES

## CAM

Sheet nr.	778
Date	15.12.2003



### ORDERING CODE :

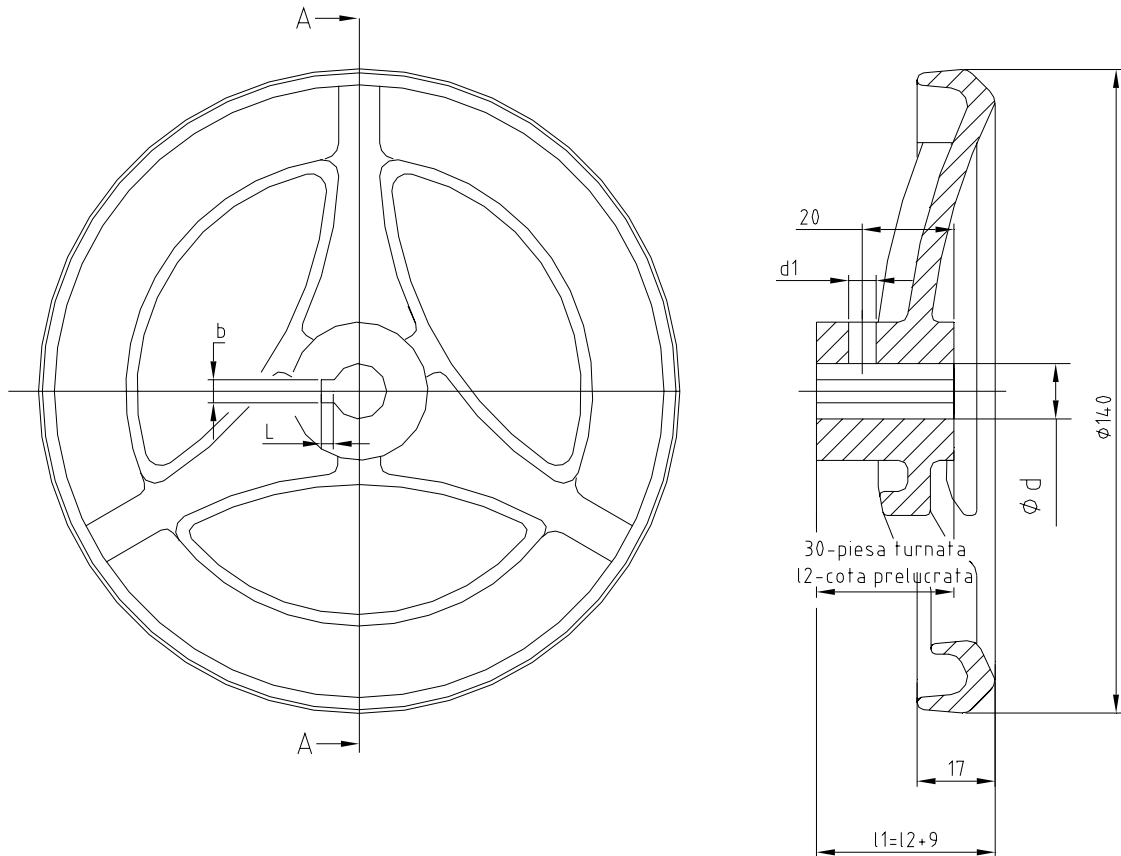
<b>CAM 1</b>	<b>- I -</b>	<b>D1 -</b>	<b>d -</b>	<b>d1 -</b>	<b>D</b>
Type	Handle bore shape	Handle bore dia			PCD Pia dia
			Rosette bore dia		

Type	D1		Ød	Ød1	A	B	C	ØD	E	Øg	n	Weight (kg)
	SHAPE											
	I(round)	F(square)										
CAM 1	Ø12 <sup>+0.080</sup>	□9....□14	13	4 <sup>+0.050</sup>	265	73	313	50*;60*;70	121	M6*;M8	2	0,500
	Ø12H7( <sup>+0.080</sup> )							50*;60*;70		M6*;M8		
	Ø16 <sup>+0.080</sup>		50*;60*;70	M6*;M8								
	Ø16H7( <sup>+0.080</sup> )		50*;60*;70	M6*;M8								
CAM 2	Ø19 <sup>+0.080</sup>	Max. □19	20	6 <sup>+0.050</sup>	360	92	404	70*;72	125	M8*;M10		0,710
	Ø22H7( <sup>+0.080</sup> )		23					70*;72		M8*;M10		
	Ø25 <sup>+0.080</sup>		26					70*;72		M8*;M10		

# ROATA DE MANA RM 140



Sheet nr.	891
Date	23.09.2004



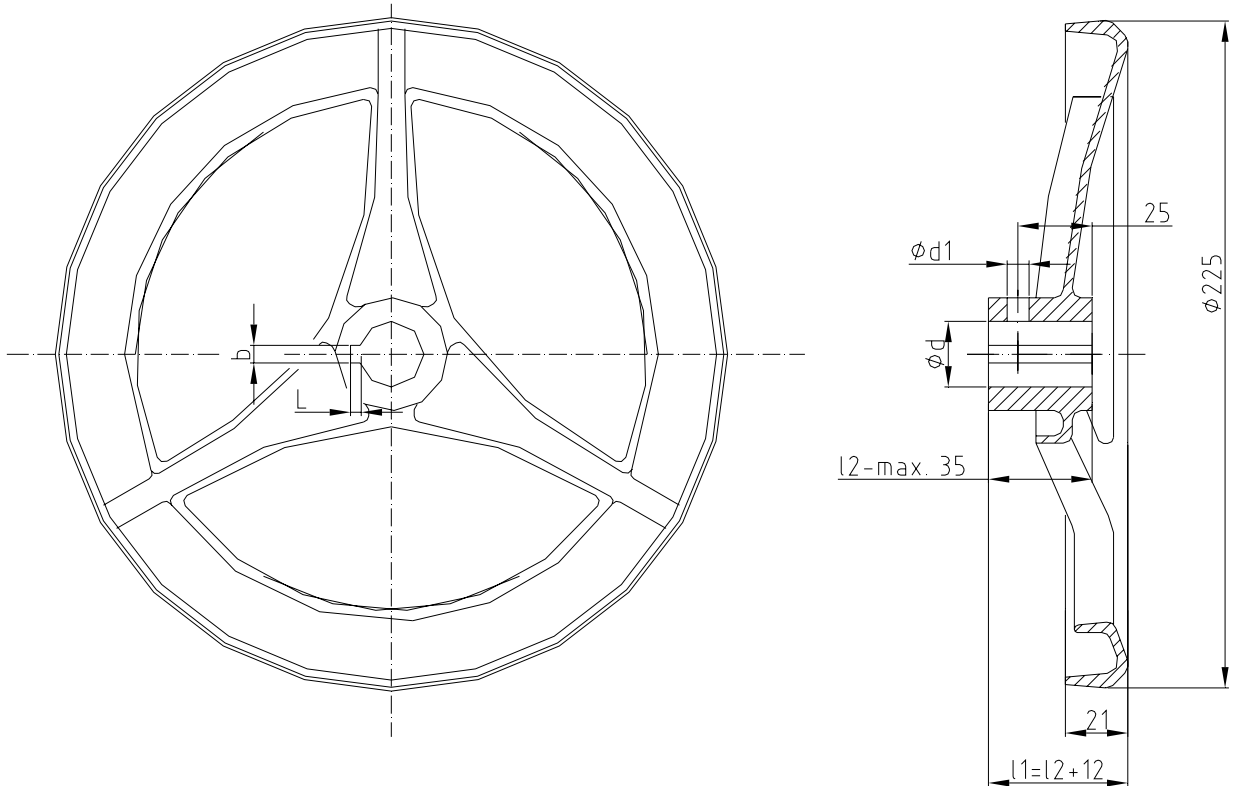
Intocmit :D.Calugaru  
Aprobat: Ing.C.Padure

Material:ALUMINIU

Alezaaj $\phi d$ <sup>+0,1</sup> / <sub>+0,05</sub>	CUPLARE					
	PS (PANA+STIFT)			PG(PANA+GAURA)		
	P-PANA	S-STIFT	$\phi d1$	P-PANA	G-GAURA	$\phi d1$
	<b>b</b>	<b>L</b>	<b><math>\phi d1</math></b>	<b>b</b>	<b>L</b>	<b><math>\phi d1</math></b>
$\phi 15$	5 <sup>+0,098</sup> / <sub>+0,040</sub>	2,3 <sup>+0,2</sup> / <sub>0</sub>	M6	-	-	-
$\phi 12$	-	-	-	-	-	$\phi 4H8$
$\phi 16$	-	-	-	-	-	$\phi 6H8$

# ROATA DE MANA RM 225

Sheet nr.	892
Date	23.09.2004



Intocmit :D.Calugaru  
Aprobat: Ing.C.Padure

Material:ALUMINIU

Alezaaj $\phi d^{+0,1}_{+0,05}$	CUPLARE					
	PS (PANA+STIFT)			PG(PANA+GAURA)		
	P-PANA	S-STIFT	$\phi d1$	P-PANA	G-GAURA	$\phi d1$
$\phi 16$	b	L	$\phi d1$	b	L	$\phi d1$
	-	-	-	-	-	$\phi 6H8$
	$5^{+0,098}_{+0,040}$	$2,3^{+0,2}_0$	M6	-	-	$\phi 4H8$
$\phi 20$	$6^{+0,098}_{+0,040}$	$2,8^{+0,2}_0$	M6	-	-	$\phi 6H8$

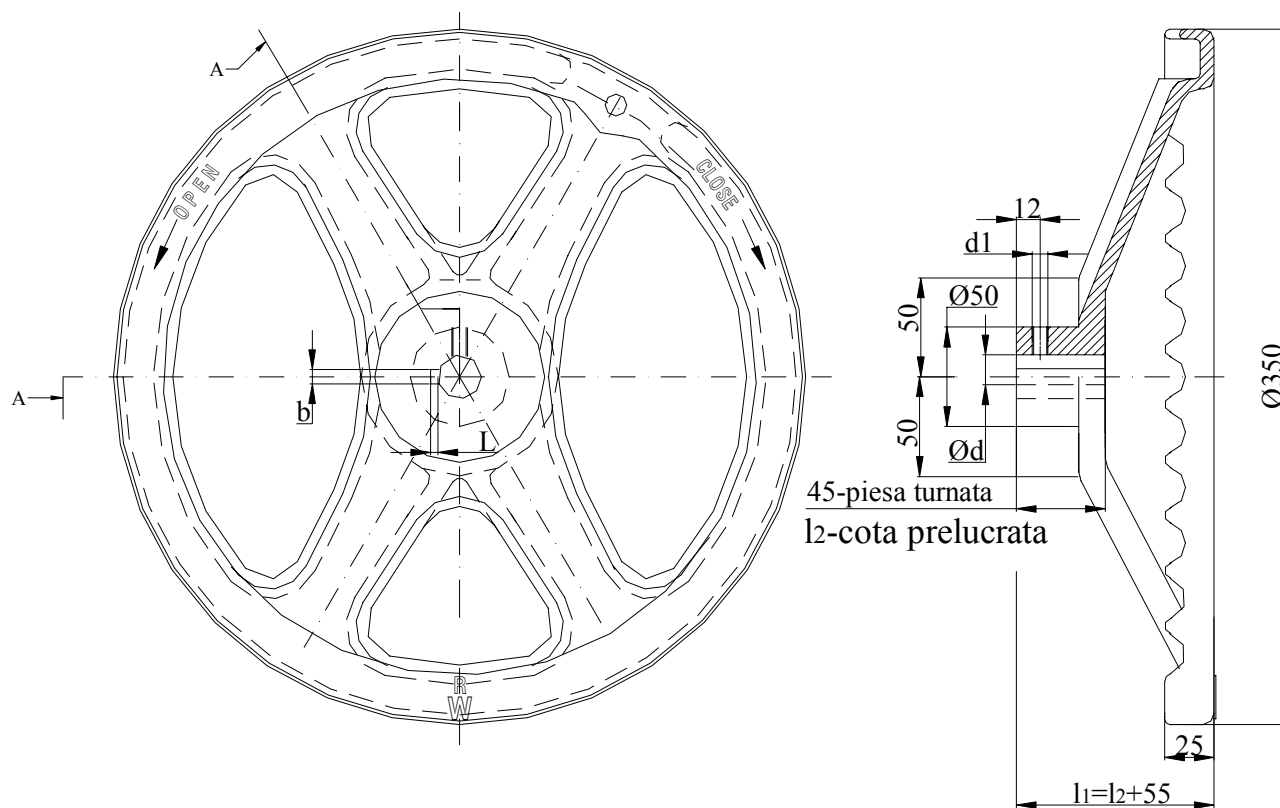
## SIMBOLIZARE:

RM 225	x	16	-	27	/	P
Tip roata						Felul
d-diametrul gaurii						cuplarii(P,S,G,PS,PG)
						l2-lungime butuc

# Roata de mana / Handwheel AV3-06



Sheet nr.	890
Date	23.09.2004



Material:ALUMINIUM

	CUPLARE					
	PS (PANA+STIFT)			PG(PANA+GAURA)		
	P-PANA	S-STIFT	Ød1	P-PANA	G-GAURA	Ød1
Alezaj Ød <sup>+0,1</sup> <sub>+0,05</sub>	<b>b</b>	<b>L</b>	<b>Ød1</b>	<b>b</b>	<b>L</b>	<b>Ød1</b>
Ø10-Ø12	4 <sup>+0,098</sup> <sub>+0,040</sub>	1,8 <sup>+0,2</sup> <sub>0</sub>	M6	-	-	
Ø17-Ø22	8 <sup>+0,098</sup> <sub>+0,040</sub>	3,3 <sup>+0,2</sup> <sub>0</sub>	M8	-	-	6H8
Ø22-Ø30	8 <sup>+0,098</sup> <sub>+0,040</sub>	3,3 <sup>+0,2</sup> <sub>0</sub>	M10	-	-	