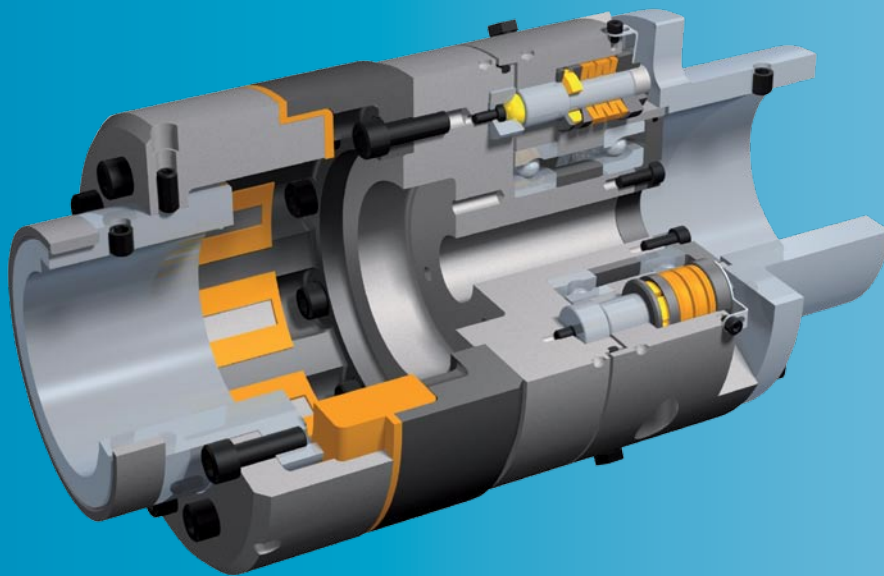


EAS[®]-dutytorque

Perfect protection for extruders



www.mayr.com

- *Simple and fast re-engagement*
- *Extremely fast separation on overload*
- *Reliable and robust*
- *Switch-off repetitive accuracy*
- *Can be disassembled radially*

K.4043.V03.GB

mayr[®]
your reliable partner

EAS® – The brand for reliable overload protection

Unsurpassed Standard Programme

For 50 years we have been developing and manufacturing torque limiting clutches and today we are able to offer everything that can be expected from the market leader:

- The most experience in development, manufacturing and application
- Extensive know-how in all drive-related issues
- Best quality and reliability
- Innovative and application-optimised further development
- The most extensive product range in load holding, load separating, torque and force limiting, frictionally locking, positive locking, magnetic, adjustable and switchable safety clutches.

Specialist for Special Solutions

Highly qualified engineers, high-performance 3D-CAD-systems, FEM calculation aids and up-to-date manufacturing and inspection devices mean that our business is perfectly equipped to develop and manufacture tailor-made and economic special solutions for our customers.

Before being released for application, each of our products has to prove its functional capabilities and reliability on different test stands. We also create the optimum protective element for your application.



A Worldwide Presence

Our Sales and Service network is constantly expanding. We guarantee you and your customer local representation almost all over the world. With eight branch firms in France, Switzerland, Italy, England, Poland, the USA, Singapore and China as well as around 30 representatives and eight subsidiaries in Germany, we provide local service for our customers in all important industrial areas.



Total Quality Management

Product Quality

Every delivery which leaves our firm has been subjected to a careful quality inspection, meaning that you are able to rely 100 % on *mayr*®-products. If required, we pre-adjust our clutches and brakes accurately to the requested values and confirm the product characteristics with an Inspection Report.

Quality Management

mayr® uses the term quality to describe its products and services. Certification of our quality management confirms the quality-consciousness of our colleagues at every level of the company.

Our integrated management system is certified according to **DIN EN ISO 9001:2000 (Quality)** and **DIN EN ISO 14001 (Environment)** and complies with the **OHSAS 18001/OHRIS (Occupational Health and Safety)** demands.

EAS[®]-dutytorque Perfect protection for your extruder

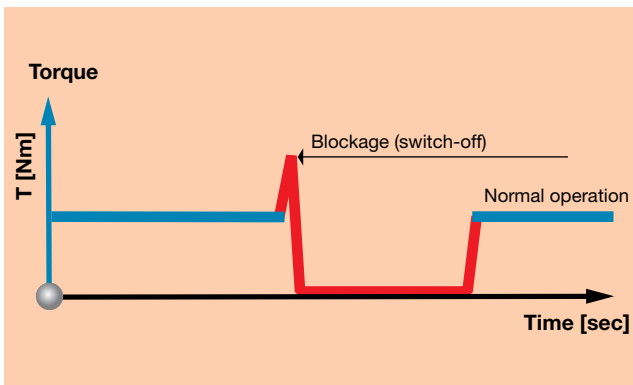
The outstanding characteristics of the EAS[®]-dutytorque

- Fast separation of input and output on overload
- High reliability due to robust mechanics
- High switch-off and repetitive accuracy
- Simple and fast re-engagement
- Can be disassembled radially without moving the motor
- High balance quality
- Extensive adjustable torque ranges
- Large shaft bores
- Long service lifetime
- Separable shaft coupling
- Minimum maintenance requirements
- Compact design

Function

In malfunction-free operation, the EAS[®]-dutytorque transmits the torque with high precision and compensates for shaft misalignments between the input and the output. If the set torque is exceeded due to malfunction or blockage, the clutch disengages reliably within a fraction of a second and separates the input and the output almost residual torque-free. The clutch remains disengaged until it is re-engaged by hand.

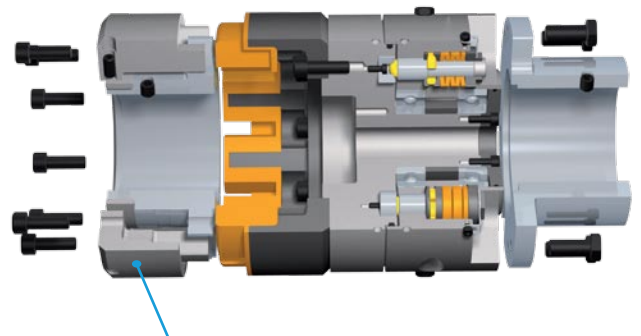
Torque Path



Why you should use the new EAS[®]-dutytorque:

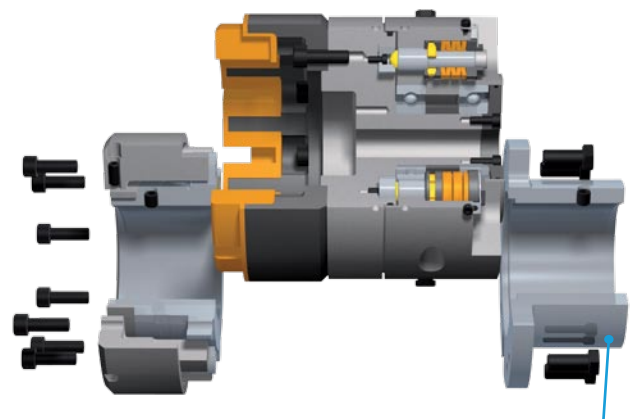
- Your extruders are protected from damage in case of malfunctions.
- You save repair costs and downtimes.
- Input and output can be separated easily on the clutch.
- Due to the large max. bores, you have free choice when selecting motors.
- The high balance quality guarantees smooth running on the drive.
- You have to invest comparatively little money in order to protect your valuable machine components from overload damage.

Slip hub of the flexible coupling



The **pushed back claw ring of the flexible coupling** allows separation of the input and output without moving the input and output axially.

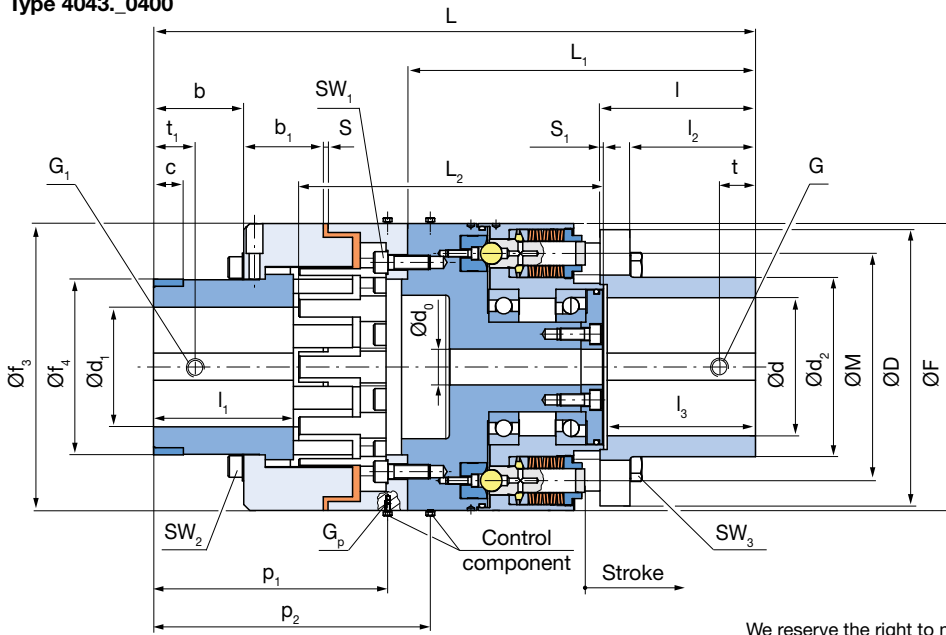
Radial Disassembly



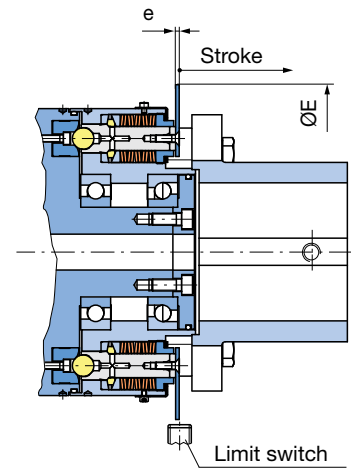
Once the claw ring is pushed back and the **EAS[®]-element clutch hub** is unscrewed, the coupling can be removed radially without moving the input and output axially.

Overload module with flexible shaft coupling and hub

Type 4043_0400



Type 4043_1400



We reserve the right to make dimensional and constructional alterations.

Dimensions [mm]	Size								
	2	3	4	5	6	7	8	9	
b	43	45	45	75,5	57	96	101,5	117	
b ₁	57	62,5	62,5	66,5	76	80	86,5	94	
c	20	20	20	25	20	35	30	40	
Ø D	185	185	240	240	240	310	310	310	
Ø d ₀	30,5	30,5	35	35	35	35	35	35	
Ø d ₂	125	125	165	165	165	190	190	190	
Ø E	250	250	280	280	280	400	400	400	
e	3	3	3	3	3	3	3	3	
Ø F	190	190	240	240	240	330	330	330	
Ø f ₃	194	214	214	240	265	295	330	370	
Ø f ₄ ¹⁾	122	136	136	147	165	182	209	242	
G ²⁾	M8 / M10	M8 / M10	M12	M12	M12	M16	M16	M16	
G ₁	M10	M12	M12	M16	M16	M16	M16	M16	
G _p	M8	M8	M8	M8	M8	M12	M12	M12	
L	368	381,5	472	510,5	512,5	636	654,5	685	
L ₁	207,5	207,5	298	298	298	372	372	372	
L ₂	202	210	255,5	262	275	326,5	335,5	345,5	
l	85	85	130	130	130	160	160	160	
l ₁	78	82,5	82,5	115,5	103,5	144	154	173	
l ₂	70	70	105	105	105	135	135	135	
l ₃	80	80	124	124	124	154	154	154	
Ø M	140	140	190	190	190	260	260	260	
p ₁	188,5	202	221	259,5	261,5	318	336,5	367	
p ₂	231	244,5	263	301,5	303,5	370	388,5	419	
S	3,5	4,0	4,0	4,0	5,5	8,0	8,0	8,0	
S ₁	3	3	3	3	3	3	3	3	
t	30	30	30	30	30	30	30	30	
t ₁	30	30	30	35	36	50	50	60	

Bores [mm]		Size								
		2	3	4	5	6	7	8	9	
EAS®-hub side	d _{max}	90	90	120	120	120	140	140	140	
Flexible side	d _{1 max}	85	95	95	100	115	130	135	160	

1) Ring outer diameter: tolerance e8.

2) Dependent on diameters d or d₁.

3) The values refer to 1.500 rpm.

4) Mass moment of inertia and weights refer to medium bores.

5) See Technical Data, page 5: Limit Torques on Overload M_G.

Technical Data				Size								
				2	3	4	5	6	7	8	9	
Limit torques on overload	Type 4043.3_400 (Torque range 3)	M _{G min}	[Nm]	70	70	150	150	150	800	800	800	
		M _{G max}	[Nm]	140	140	400	400	400	2000	2000	2000	
	Type 4043.4_400 (Torque range 4)	M _{G min}	[Nm]	140	140	350	350	350	2000	2000	2000	
		M _{G max}	[Nm]	280	280	900	900	900	4000	4000	4000	
	Type 4043.5_400 (Torque range 5)	M _{G min}	[Nm]	170	170	700	700	700	3000	3000	3000	
		M _{G max}	[Nm]	350	350	1400	1400	1400	6000	6000	6000	
	Type 4043.6_400 (Torque range 6)	M _{G min}	[Nm]	350	350	1400	1400	1400	6000	6000	6000	
		M _{G max}	[Nm]	700	700	2800	2800	2800	9000	12000	12000	
	Type 4043.7_400 (Torque range 7)	M _{G min}	[Nm]	700	700	-	2000	2800	-	-	8500	
		M _{G max}	[Nm]	1400	1400	-	4000	5600	-	-	17000	
	EAS [®] -element	Size			01	01	0	0	0	1	1	1
		Number	Torque ranges 3 to 6		2	2	2	2	2	3	3	3
		Torque range 7		4	4	-	2	4	-	-	3	
Maximum speed		n _{max}	[rpm]	3500	3000	3000	2750	2500	2250	2000	1750	
Bolt stroke on overload			[mm]	4	4	6	6	6	8	8	8	
Flexible shaft coupling Type 4043.__400	Nominal torque	T _{KN}	[Nm]	1650	2400	2400	3700	5800	7550	9900	14000	
	Impact torque	T _{KS}	[Nm]	2400	4200	4200	6200	8300	10500	14500	20000	
	Permitted shaft mis-alignments ³⁾	axial	ΔK _a	[mm]	± 1,5	± 2,0	± 2,0	± 2,0	± 2,5	± 2,5	± 2,5	± 2,5
		radial	ΔK _r	[mm]	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
		angular	ΔK _w	[mm]	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3

Mass Moments of Inertia and Weights				Size							
				2	3	4	5	6	7	8	9
Mass moments of inertia ⁴⁾	EAS [®] -hub side	J	[kgm ²]	0,088	0,088	0,318	0,318	0,318	1,244	1,244	1,244
	Flexible side	J	[kgm ²]	0,136	0,192	0,319	0,416	0,587	1,499	1,967	2,756
Weight ⁴⁾			[kg]	47,5	52,2	90,3	98	108,9	213,5	238,2	265,3

Screws Type 4043.__400				Size							
				2	3	4	5	6	7	8	9
In claw ring and cam ring	Number			9xM10	9xM12	9xM12	10xM12	10xM14	10xM14	10xM16	11xM16
	Wrench opening	SW ₁ /SW ₂	[mm]	8	10	10	10	12	12	14	14
	Tightening torque		[Nm]	71	143	143	143	220	220	350	350
In the hub, overload-side	Number			8xM12	8xM12	8xM16	8xM16	8xM16	9xM20	9xM20	9xM20
	Wrench opening	SW ₃	[mm]	19	19	24	24	24	30	30	30
	Tightening torque		[Nm]	122	122	300	300	300	590	590	590

Order Number

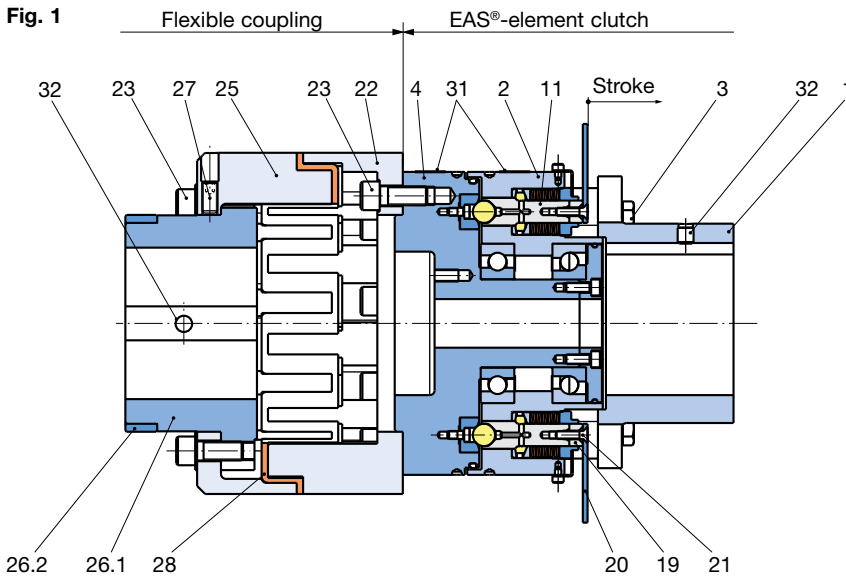
Design

3 Overload module with flexible shaft coupling and hub



__	/	4	0	4	3	.	__	__	4	0	0	/	__	/	__
▲					▲		▲	▲	▲				▲		▲
Sizes		Torque range ⁵⁾			Switching disk		Claw ring		Bore		Bore				
2 to 9		Torque range 3	Torque range 4	Torque range 5	Torque range 6	Torque range 7	0 without 1 with	0 moveable/ clampable	Ø d ^{H7}		Ø d ₁ ^{H7}				

Example: 4 / 4043.61400 / 100 / 90



Parts List	
1	Hub
2	Element flange
3	Hexagon head screw
4	Pressure flange
11	Overload element
19	Distance bushing
20	Switching disk (Type 4043._1400)
21	Countersunk screw
22	Cam ring
23	Cap screw
25	Claw ring
26.1	Flange hub
26.2	Centring ring (Type 4043._400)
27	Set screw (Type 4043._400)
28	Flexible intermediate ring
31	Guideline sign 'Re-engagement position'
32	Set screw

Design

The EAS®-dutytorque clutches are mechanically disengaging overload clutches (EAS®-element clutches) with a mounted, pluggable elastomer compensation coupling (flexible coupling).

The elastomer compensation coupling compensates for misalignments of the shaft ends (for the maximum permitted shaft misalignments, see Technical Data, page 5) and consists of the following components: Flange hub (26.1), claw ring (25), flexible intermediate ring (28), cam ring (22) and the cap screws (23).

In case of impact-loaded operation, the flexible coupling is dimensioned according to the catalogue *EAS®-element clutch K.440.V._GB*.

At the flange hub (26.1) end, there is a centring ring (26.2, only Type 4043._400), which is intended for holding the claw ring (25) in disassembled state.

Disassembly of the claw ring (25) is necessary when:

- the flexible intermediate ring (28) of the coupling has to be replaced, or
- the running characteristics of the motor in dry running have to be checked; the input and the output can be separated without moving the motor (see 'Radial Disassembly').

In the element flange (2), there are 2 cone lubricating nipples for greasing the bearing and 2 to 4 cone lubricating nipples (dependent on the Size and the Type) for greasing the overload elements (11).

Function

When the set limit torque is exceeded (overload), the clutch disengages. The bolts (11.1.1, Fig. 3) in the overload elements (11) carry out an axial movement (stroke) and remain disengaged.

In disengaged state, the clutch slows down freely without any residual torque.

The drive can be switched off electrically via:

- a limit switch (only for design with switching disk (20); the switching disk stroke can be used for overload identification via a limit switch), or
- a speed monitoring: for this there are 2 hexagon head screws (control components, see Fig. on page 4). They can either be screwed into the pressure flange (4) or in the element flange (2).

Torque Adjustment

The limit torque M_G for overload is set by changing the cup spring pre-tension (11.8, Fig. 2) on each overload element (11).

For this, dimension "a" is determined using the Adjustment Diagram included in clutch delivery. Dimension "a" is the distance between the hub (1, Fig. 2) and the facing side of the adjusting nut (11.4, Fig. 2). The adjusting nut (11.4) in the overload element (11) is turned to this dimension "a" using an open-ended wrench.

Radial Disassembly

For a detailed installation description, please see the Installation and Operational Instructions corresponding to the product.

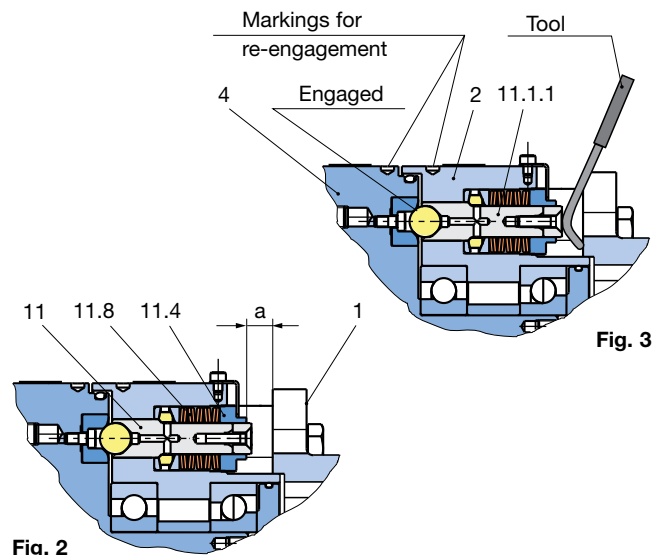
- 1) Remove the cap screws (23) in the claw ring (25).
- 2) Pull the claw ring (25) back to the flange hub (26.1) end until reaching the centring (centring ring 26.2, Type 4043._400).
- 3) Tighten the 3 set screws (27, Type 4043._400).
- 4) Remove the hexagon head screws (3) in the element flange (2).
- 5) Take the remaining part of the clutch (element flange (2), pressure flange (4) and cam ring (22)) out radially between the input and the output.
- 6) The motor can be checked via short-term acceleration or the intermediate ring (28) can be removed axially.

Re-engagement

The marking bores on the outer diameter of the element flange (2) and the pressure flange (4) must align.

Re-engagement is carried out simple by placing axial pressure on the bolt ends of each overload element. Depending on the means available, the accessibility of the installation space etc., re-engagement can be carried out in different ways:

- manually, using a suitable tool (Fig. 3)
- by tapping with a plastic hammer



Headquarters

Chr. Mayr GmbH + Co. KG
Eichenstrasse 1, D-87665 Mauerstetten
Tel.: 0 83 41/8 04-0, Fax: 0 83 41/80 44 21
www.mayr.com, E-Mail: info@mayr.com



mayr[®]

Service Germany

Baden-Württemberg

Esslinger Straße 7
70771 Leinfelden-Echterdingen
Tel.: 07 11/45 96 01 0
Fax: 07 11/45 96 01 10

Bavaria

Eichenstrasse 1
87665 Mauerstetten
Tel.: 0 83 41/80 41 04
Fax: 0 83 41/80 44 23

Chemnitz

Bornaer Straße 205
09114 Chemnitz
Tel.: 03 71/4 74 18 96
Fax: 03 71/4 74 18 95

Franken

Unterer Markt 9
91217 Hersbruck
Tel.: 0 91 51/81 48 64
Fax: 0 91 51/81 62 45

Hagen

Im Langenstück 6
58093 Hagen
Tel.: 0 23 31/78 03 0
Fax: 0 23 31/78 03 25

Kamen

Lünener Strasse 211
59174 Kamen
Tel.: 0 23 07/23 63 85
Fax: 0 23 07/24 26 74

North

Schiefer Brink 8
32699 Extertal
Tel.: 0 57 54/9 20 77
Fax: 0 57 54/9 20 78

Rhine-Main

Hans-Böckler-Straße 6
64823 Groß-Umstadt
Tel.: 0 60 78/7 82 53 37
Fax: 0 60 78/9 30 08 00

Branch office

China

Mayr Zhangjiagang
Power Transmission Co., Ltd.
Changxing Road No. 16,
215600 Zhangjiagang
Tel.: 05 12/58 91-75 65
Fax: 05 12/58 91-75 66
info@mayr-ptc.cn

Great Britain

Mayr Transmissions Ltd.
Valley Road, Business Park
Keighley, BD21 4LZ
West Yorkshire
Tel.: 0 15 35/66 39 00
Fax: 0 15 35/66 32 61
sales@mayr.co.uk

France

Mayr France S.A.
Z.A.L. du Minopole
BP 16
62160 Bully-Les-Mines
Tel.: 03.21.72.91.91
Fax: 03.21.29.71.77
contact@mayr.fr

Italy

Mayr Italia S.r.l.
Viale Veneto, 3
35020 Saonara (PD)
Tel.: 0 49/8 79 10 20
Fax: 0 49/8 79 10 22
info@mayr-italia.it

Singapore

Mayr Transmission (S) PTE Ltd.
No. 8 Boon Lay Way Unit 03-06,
TradeHub 21
Singapore 609964
Tel.: 00 65/65 60 12 30
Fax: 00 65/65 60 10 00
info@mayr.com.sg

Switzerland

Mayr Kupplungen AG
Tobeläckerstrasse 11
8212 Neuhausen am Rheinfall
Tel.: 0 52/6 74 08 70
Fax: 0 52/6 74 08 75
info@mayr.ch

USA

Mayr Corporation
4 North Street
Waldwick
NJ 07463
Tel.: 2 01/4 45-72 10
Fax: 2 01/4 45-80 19
info@mayrcorp.com

Representatives

Australia

Transmission Australia Pty. Ltd.
22 Corporate Ave,
3178 Rowville, Victoria
Australien
Tel.: 0 39/7 55 44 44
Fax: 0 39/7 55 44 11
info@transaus.com.au

China

Mayr Power Transmission Co., Ltd.
Shanghai Representative Office
Room 2206, No. 888 Yishan Road
200233 Shanghai, VR China
Tel.: 0 21/64 32 01 60
Fax: 0 21/64 57 56 21
Trump.feng@mayr.de

India

National Engineering
Company (NENCO)
J-225, M.I.D.C.
Bhosari Pune 411026
Tel.: 0 20/27 13 00 29
Fax: 0 20/27 13 02 29
nenco@nenco.org

Japan

MATSUI Corporation
2-4-7 Azabudai
Minato-ku
Tokyo 106-8641
Tel.: 03/35 86-41 41
Fax: 03/32 24 24 10
k.goto@matsui-corp.co.jp

South Africa

Torque Transfer
Private Bag 9
Elandsfontein 1406
Tel.: 0 11/8 99 00 00
Fax: 0 11/8 99 65 74
torque@bearings.co.za

South Korea

Mayr Korea Co. Ltd.
Room No.1002, 10th floor,
Nex Zone, SK TECHNOPARK,
77-1, SungSan-Dong,
SungSan-Gu, Changwon, Korea
Tel.: 0 55/2 62-40 24
Fax: 0 55/2 62-40 25
info@mayrkorea.com

Taiwan

German Tech Auto Co., Ltd.
No. 162, Hsin sheng Road,
Taishan Hsiang,
Taipei County 243, Taiwan R.O.C.
Tel.: 02/29 03 09 39
Fax: 02/29 03 06 36
steve@zfgta.com.tw

Machine tools

Applications in China
Dynamic Power Transmission Co., Ltd.
Block 5th, No. 1699, Songze Road,
Xujing Industrial Zone
201702 Shanghai, China
Tel.: 021/59883978
Fax: 021/59883979
dtcshanghai@online.sh.cn

More representatives:

Austria, Benelux States, Brazil, Canada, Czech Republic, Denmark, Finland, Greece, Hongkong, Hungary, Indonesia, Israel, Malaysia, New Zealand, Norway, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Thailand, Turkey

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Product Summary

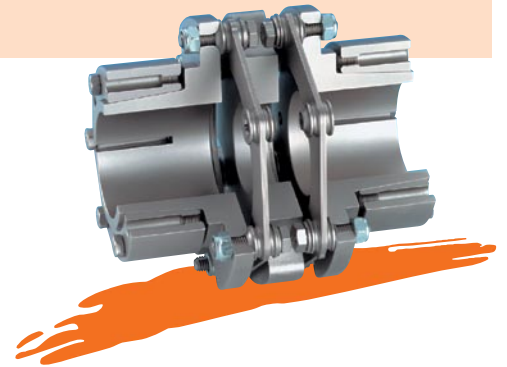
Safety Clutches/Overload Clutches

- ❑ **EAS®-Compact®/EAS®-NC**
Positive locking and completely backlash-free torque limiting clutches
- ❑ **EAS®-smartic®**
Cost-effective torque limiting clutches, quick installation
- ❑ **EAS®-element clutch/EAS®-elements**
Load-disconnecting protection against high torques
- ❑ **EAS®-axial**
Exact limitation of tensile and compressive forces
- ❑ **EAS®-Sp/EAS®-Sm/EAS®-Zr**
Load-disconnecting torque limiting clutches with switching function
- ❑ **ROBA®-slip hub**
Load-holding, frictionally locked torque limiting clutches
- ❑ **ROBA®-contitorque**
Magnetic continuous slip clutches



Shaft Couplings

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Perfect precision couplings for servo and stepping motors
- ❑ **ROBA®-ES**
Backlash-free and damping for vibration-sensitive drives
- ❑ **ROBA®-DS/ROBA®-D**
Backlash-free, torsionally rigid all-steel couplings
- ❑ **EAS®-control-DS**
Cost-effective torque-measuring couplings



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Multifunctional all-round safety brakes
- ❑ **ROBA-stop®-M motor brakes**
Robust, cost-effective motor brakes
- ❑ **ROBA-stop®-S**
Water-proof, robust monoblock brakes
- ❑ **ROBA-stop®-Z/ROBA-stop®-silenzio®**
Doubly safe elevator brakes
- ❑ **ROBA®-diskstop®**
Compact, very quiet disk brakes
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Brake systems for gravity loaded axes
- ❑ **ROBA®-linearstop**
Backlash-free brake systems for linear motor axes
- ❑ **ROBATIC®/ROBA®-quick/ROBA®-takt**
Electromagnetic clutches and brakes, clutch brake units



DC Drives

- ❑ **tendo®-PM**
Permanent magnet-excited DC motors
- ❑ **tendo®-SC**
1 quadrant and 4 quadrant transistor controllers

