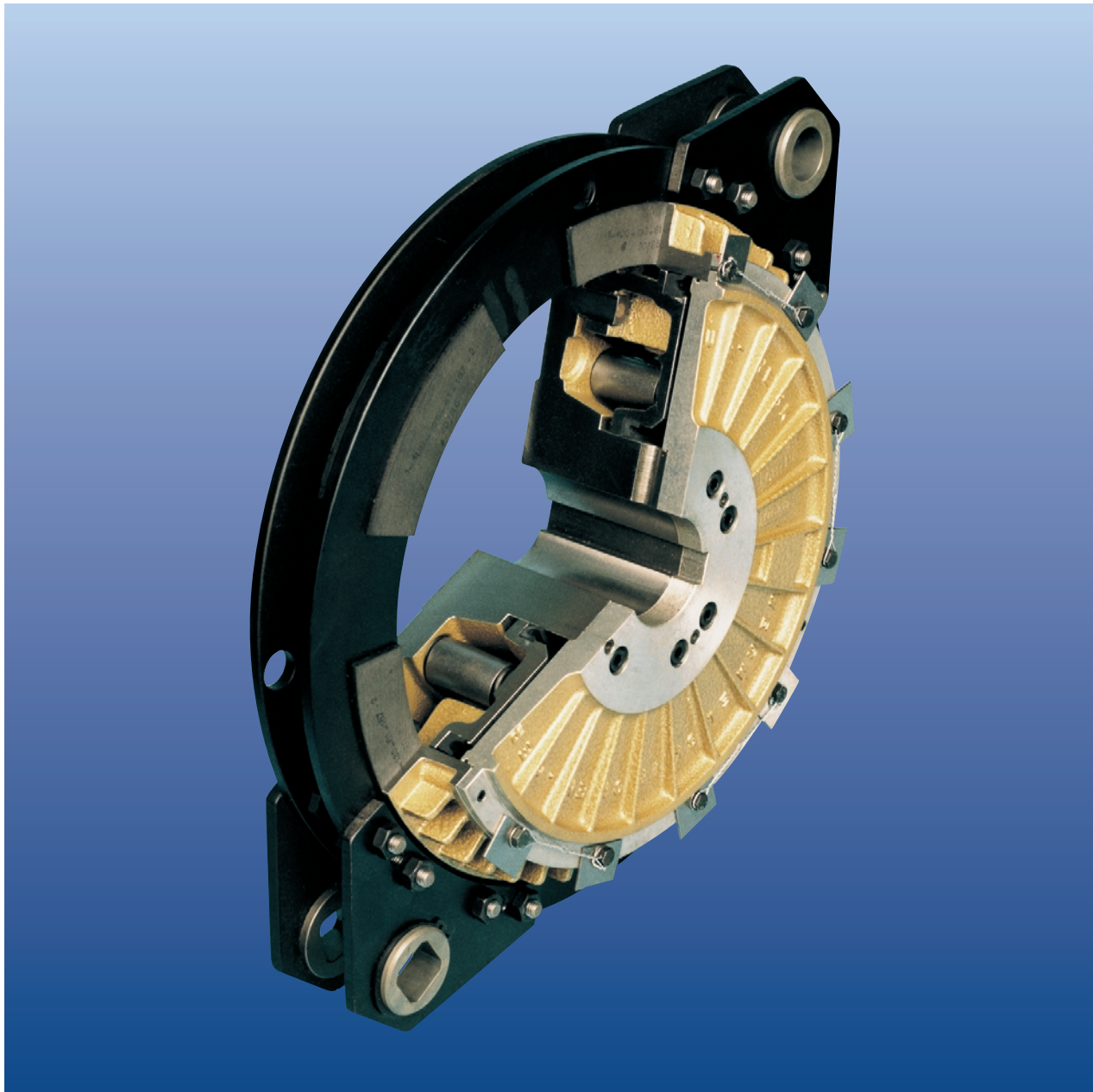


# ■ Pneumatically actuated clutches and spring-applied brakes

clutch/brake combined units and tooth clutches



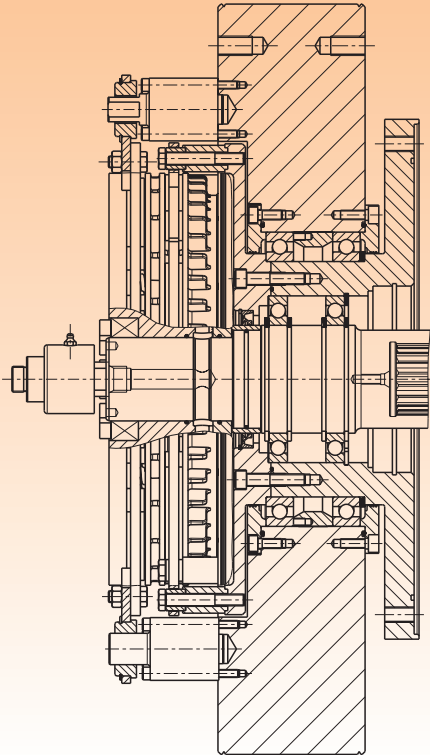
# ■ Pneumatically actuated clutches and spring-applied brakes clutch/brake combined units and tooth clutches



Compressed air represents a secondary source of power that is clean and easy to handle. All types of Ortlinghaus clutches and brakes therefore are offered with pneumatic actuation.

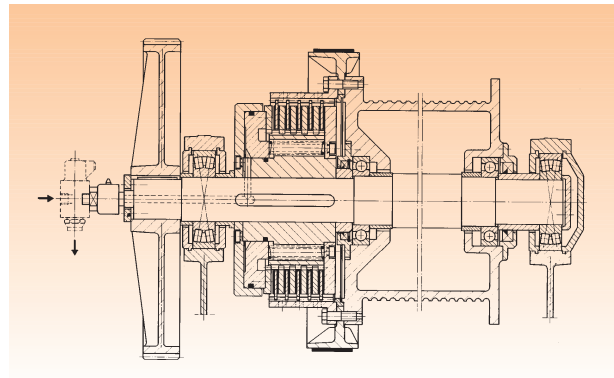
In many production shops a powerful compressed air network is already present, compressed air is “clean” and there is no danger of fire in the case of leaks. It is simple to transport and to control and permits in addition rapid and precise operating times even at high operating frequencies. Furthermore the amount of maintenance required for both the compressed air supply system and for the pneumatic clutches and brakes is small.

With torque ratings ranging from 20 Nm to over 100,000 Nm the pneumatic range of clutches and brakes are widely used in all fields of mechanical engineering. Operating pressure of 5.5 bar is required to a maximum of 6.0 bar.



Clutch/brake combined unit with short and long lugs for two-point plate suspension, series **0420**

## Application examples



Pneumatically actuated multi-plate clutch, series **0421**, on the winch drive of a mobile crane.

NO.	Series		Torque range	Hub bore		External diameter	
			Nm*	mm		mm	
<b>1</b>	0406	Clutch	350 to 67000	35 to 220	188 to 830		
		Brake	425 to 12700				
	0420	Clutch	180 to 93000	15 to 270	166 to 1140		
		Brake	110 to 59000				
<b>2</b>	0424	Clutch	5400 to 58000	70 to 250	380 to 710		
		Brake	3400 to 22000				
<b>3</b>	0404	Clutch	63 to 180	28 and 38 **	200 to 300 ***		
		Brake	63 to 180				
<b>4</b>	0442		175 to 49200	55 to 285	195 to 740		
<b>5</b>	0452		90 to 22000	55 to 285	195 to 740		
<b>6</b>	0421		160 to 3150	18 to 82	95 to 252		
	0409		27 to 200	18 to 30	68 to 102		
<b>7</b>	0521		160 to 5000	15 to 110	100 to 305		
<b>8</b>	0422-..0/-..9		20 to 2700	18 to 150	83 to 400		
<b>9</b>	0422-..1		125 to 1040	30 to 110	170 to 315		
<b>10</b>	0415		220 to 1600	45 to 100	190 to 330		
<b>11</b>	0412-00.		80 to 620	32 to 55	81 to 134		
<b>12</b>	0412-01.		65 to 630	32 to 55	81 to 134		

\* Higher torques on request

\*\* Shaft or bore diameter

\*\*\* Flange Diameter

## Single-plate clutch/brake combined units for dry-running

### 1 Series 0406 and 0420

These pneumatically actuated clutch/brake combined units have been designed to meet the ever increasing performance and safety requirements in presses. The series 0406 offers the optimum in terms of maximum clutch and brake torques with the smallest of dimensions, i.e. high performance compact design. The highly successful forerunner to the 0406 series, the 0400 is still available today for replacement requirements; in the case of new designs, however, the 0406 and 0420 series should be used. These combined units represent the optimum drive component in stamping and forming presses and offer excellent adaptability in the following areas:

- 12-point suspension of the friction plates or two-point suspension with lugs of the same or different lengths, giving flexibility for different applications.
- Friction element selection, based on shape and material, to obtain the most effective service life with quiet operation under all conditions. The friction block version is to be recommended for machines with either high dynamic loading or load reversals under continuous operation.
- Securing to the shaft or crank shaft can be with the aid of either keys or locking assemblies, these being fitted on the clutch side with series 0-420 and on the brake side with series 0-406.

#### Friction combination:

Cast iron/organic friction lining or cast iron/friction block of organic friction material.

**Air intake:** Via rotary inlet through the shaft.

**Application:** On stamping and forming presses, on deep-drawing presses, embossing presses and similar machines.

## Multi-plate clutch/brake combined units for wet-running

### 2 Series 0424

This series offers both the advantages of oil cooled wet-running plates, as with series 0023 and 0123, together with, pneumatic actuation. Pneumatic actuation can be of advantage when hydraulic oil is not available or economically does not appear advisable.

Key connection or locking assemblies for securing the clutch/brake to the shaft are available.

**Friction combination:** Steel/sinter lining

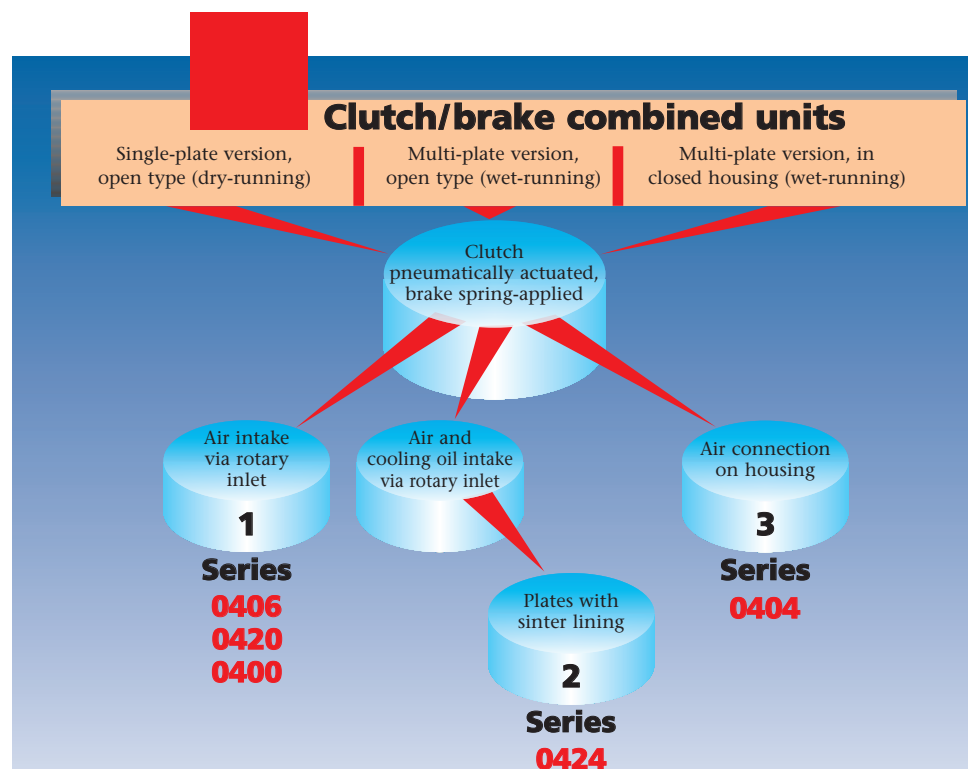
**Air and cooling oil intake:** Via rotary inlet through the shaft.

**Application:** In stamping, embossing and deep drawing presses and similar machines.

## Wet-running multi-plate clutch/brake combined units in a closed housing

### 3 Series 0404

Fully encapsulated, oil cooled clutch/brake combined units in two sizes which are matched in terms of their torques and dimensions to electric motors of sizes 100, 112 and 132.



The units are offered with various housings such as foot mounted and shafts or with hollow shafts and securing flanges.

A significant increase in the engaging performance can be achieved using an externally mounted electric fan and by circulating oil through the housing.

**Friction combination:** Steel/sinter lining

**Air intake:** Connection on the housing.

**Application:** Where high switching frequency and excellent, repeatable stopping is required as, for example, with packing, metering and cutting machines, i.e. everywhere where rapid and precise movements or feeds are required.

**Clutches and brakes with internally air-cooled friction plates for dry-running**

**4/5 Series 0442 and 0452**

These pneumatically engaged, spring-released clutches with up to three plates and pneumatically released, spring-applied brakes with up to two plates utilise identical components. The plates of the single and two-plate versions are internally air-cooled which allows excellent heat dissipation and therefore high operation speeds.

The three-plate version of the clutch is recommended for applications where the transmission of high torque is required, however,

it is not possible to use the three plate version as a brake.

The brakes can be matched precisely to the particular application by correct selection of the springs. External cooling increases the thermal capacity of the brake considerably.

For particular applications where there is high dynamic work or alternating torques as with deep drawing presses, the clutch and brake can be fitted with friction blocks instead of linings. The extremely small moments of inertia of the hub and inner plate combined with the small air volume of the actuating cylinder, enable high engagement rates and short switching times to be achieved.

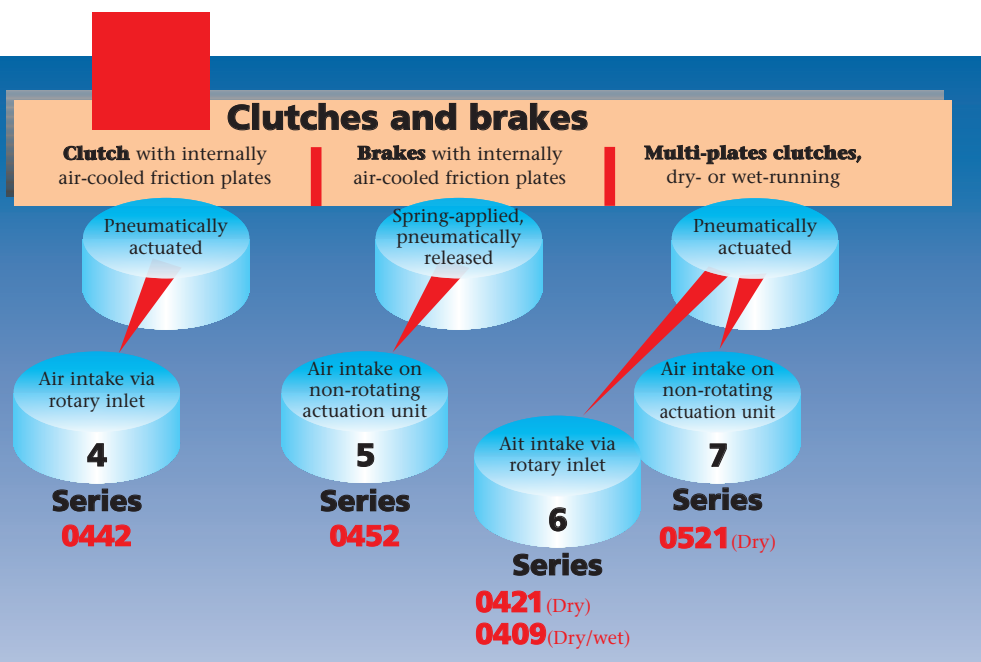
As a rule not only the clutch but also the brake is mounted on the shaft end.

**Friction combination:** Cast iron/organic friction lining or cast iron/friction block of organic friction material.

**Air intake:** Via a rotary inlet with the clutch and on the fixed cylinder of the brake.

**Application:** These clutches and brakes are for "heavy duty work" in general mechanical engineering. In particular, hot forging presses, cold forming machines or shears in rolling operations. They can be used, not only individually, but also as a pair when single cycling is required. The brakes are approved by the relevant German Employer's Liability

Insurance Association, as auxiliary brakes in press drives where they can supplement single-plate clutch/brake combined units when an appropriate monitoring function is provided.



## Multi-plate clutches for dry- or wet-running

### 6 Series 0421 and 0-409

Based on well known design principles, that have proved themselves in applications over many years, these clutches are to be found in use where compressed air is the preferred source of power, for reasons of cleanliness or rapid engagement times.

The 0421 is designed for dry-running only, the series 0409 however can be fitted with sinter plates for dry- or wet-running.

**Friction combination:** Steel/organic friction lining with 0421; steel/sintered lining for wet- or dry-running with 0409

**Air intake:** Via rotary inlet through the shaft.

**Application:** Primarily in vehicle auxiliary drives and in printing machines.

## Multi-plate clutches with non-rotating actuation unit for dry-running

### 7 Series 0521

These clutches are comparable in terms of their performance with those of series 0-421. However they offer, in addition, the advantage of a stationary cylinder, as a result air intake holes in the shaft and separate rotary inlets are not required.

**Friction combination:** Steel/organic friction lining.

**Air intake:** On non rotating cylinder.

**Application:** Primarily in cases where a free shaft end is not available as, for example, in the case of vehicle auxiliary drives and printing machines.

## Spring-applied multi-plate brakes for dry-running

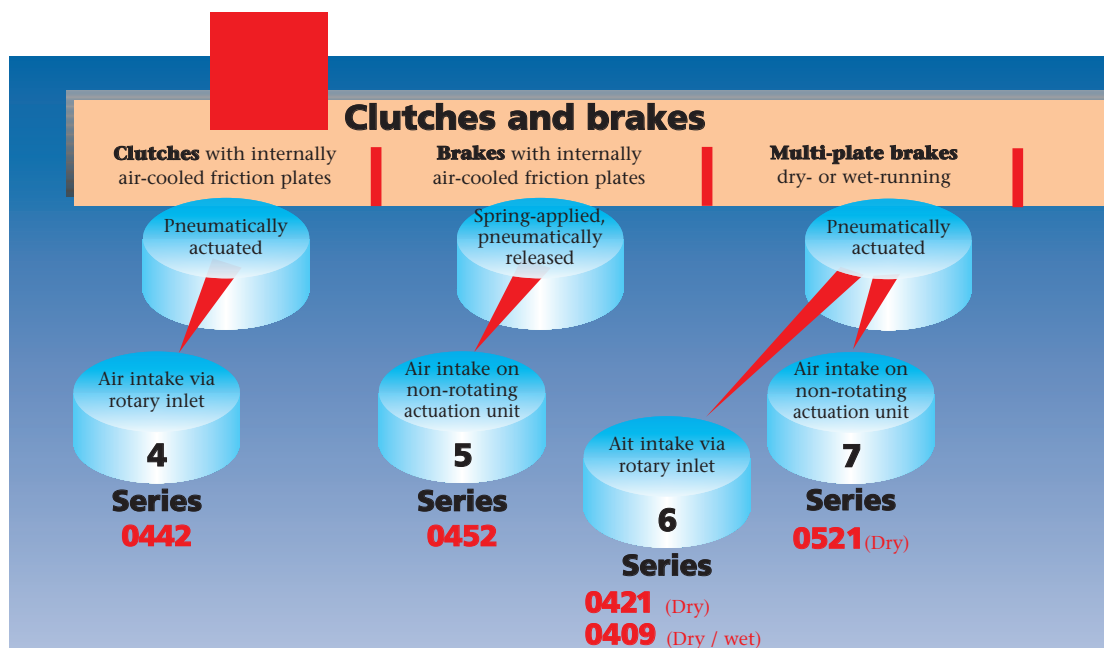
### 8/9 Series 0422-..0/-..9/-..1

These spring-applied fail safe brakes have the same form of construction as the hydraulically released brakes of series 0022, the difference being that they are released with compressed air which is fed into the stationary cylinder. Precise operation and tough construction of the steel/organic lining friction combination characterise these brakes. There are versions with or without a centering function and in addition an emergency release facility can be fitted to enable the brake to be released should the compressed air supply fail.

**Friction combination:** Steel/organic friction lining

**Air intake:** At the stationary cylinder

**Application:** With pneumatic drives in general mechanical engineering or for safety applications, for example with mining machines.



**Spring-applied multi-plate brakes for dry-running**

**10 Series 0415**

A spring-applied fail safe brake with the friction combination steel/special sinter for dry-running, which can be used for both holding and dynamic applications.

Special characteristics are:

Maintenance free operation together with the following options:

- Monitoring of the brake position by means of microswitches.
- Emergency release by means of manual lever or intergrated screws.
- Mounting of an operating valve directly onto the brake.

**Friction combination:** Steel/special sinter for dry-running

**Air intake:** On the housing of the brake

**Application:** On electric motors and the shaft ends of machines and gearboxes.

**Tooth clutches for dry- or wet-running**

**11/12 Series 0412-00./-01.**

These clutches are recommended where high torques are to be transmitted, without slipping, in a confined space. Care must be taken that engagement is carried out when the shafts are stationary or when the difference in their speed

is only small (maximum 50 min<sup>-1</sup>).

The clutches are free of residual torque when disengaged.

A choice can be made between clutches which are pneumatically applied (series 0-412-00.) or spring-applied, pneumatically released, (series 0412-01.).

In addition to the „normal tooth“ version in which the plates can mesh at any point, there is also a tooth design available which can only mesh at one point on the circumference so that the shafts are always at the same position relative to one another when the clutch is engaged.

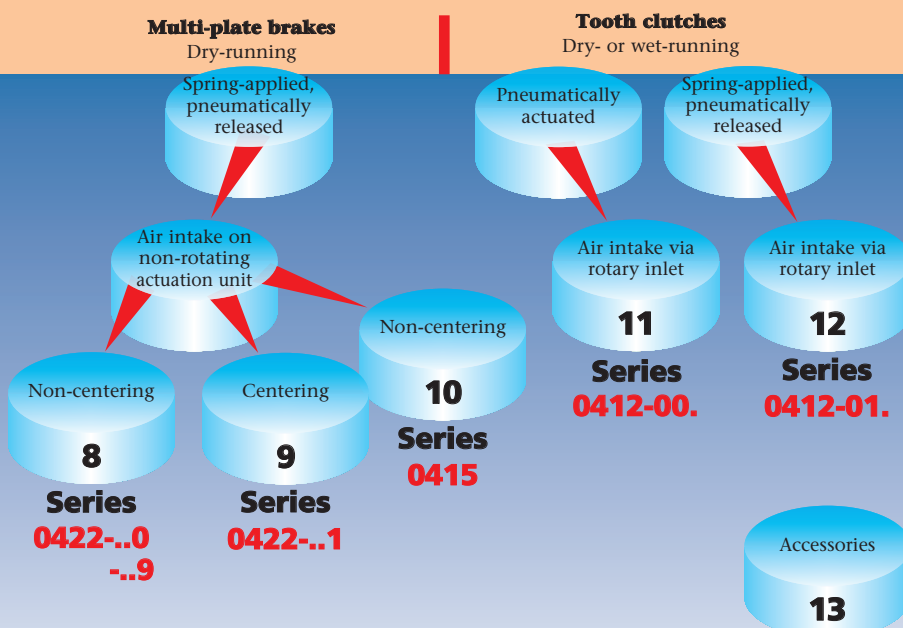
**Air intake:** Via rotary inlet through the shaft

**Application:** Auxiliary drives of high performance automatic printing machines.

**13 Accessories**

For operation of these products we can offer the following accessories:

- Rotary inlets
- Rotary inlets with 3/2 distributor valve.
- Press safety valves
- Electric fan for additional cooling



# Fax questionnaire

for clutches and brakes in general as well as in particular clutches and brakes for presses. Please complete in block capitals!

**Ortlinghaus** SINCE 1898

THE TECHNOLOGY OF CONTROLLED TORQUE

Sender:

Name, first name

Company

Department

Telephone (extension)

Fax

Recipient:

Ortlinghaus-Werke GmbH  
Kenkhauser Straße 125 · Postbox 14 40  
42907 Wermelskirchen · Germany  
Tel. +49 2196 85-0 · Fax +49 2196 855-444  
info@ortlinghaus.com · www.ortlinghaus.com

for the attention of (if known)

**Fax-No. +49 2196 855-444**

## For clutches and brakes:

### Actuation type:

hydraulic  pneumatic   
spring-applied

### Drive machine:

Elektric motor  Combustion engine   
Hydraulic motor  Other: \_\_\_\_\_

### Drive situation:

### Fitting situation:

Rotary axis horizontal  Vertical   
Exposed  In closed housing

**Shaft diameter:** on drive input  $d_1 =$  \_\_\_\_\_ mm  
on drive output  $d_2 =$  \_\_\_\_\_ mm

**Motor data:** Capacity  $P =$  \_\_\_\_\_ kW  
Speed  $n =$  \_\_\_\_\_ min<sup>-1</sup>

### Torques on clutch or brake:

Switchable torque  $M_s =$  \_\_\_\_\_ Nm  
Transmittable torque  $M_{\bar{u}} =$  \_\_\_\_\_ Nm  
Load torque  $M_L =$  \_\_\_\_\_ Nm  
Course of  $M_L$ , when this changes: \_\_\_\_\_

**Initial input drive speed:**  $n_{10} =$  \_\_\_\_\_ min<sup>-1</sup>

**Initial output drive speed:**  $n_{20} =$  \_\_\_\_\_ min<sup>-1</sup>

**Max. relative speed ratio:**  $^3_n =$  \_\_\_\_\_ min<sup>-1</sup>

### Conditions at switching:

Stationary  Full load  Without load

Switching frequency  $S_n =$  \_\_\_\_\_ h<sup>-1</sup>

Acceleration/deceleration time  $t_3 =$  \_\_\_\_\_ s

### Moment of inertia about clutch or brake shaft axis:

Input drive side  $J_A =$  \_\_\_\_\_ kgm<sup>2</sup>

Output drive side  $J_L =$  \_\_\_\_\_ kgm<sup>2</sup>

Course of  $J_A$  ,  $J_L$  ,  
when these change: \_\_\_\_\_

### Further details:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## For press clutches and brakes:

**Actuation type:** pneumatic  hydraulic

### Arrangement:

Clutch and brake separated  Auxiliary brake   
Clutch and brake combined  with auxiliary brake

**Fitting position:** Rotary axle horizontal  Vertical

**Shaft diameter**  $d =$  \_\_\_\_\_ mm

**Bore diameter**  $A =$  \_\_\_\_\_ mm

### Driver on the shaft:

Feather keys  Clamping set/contraction disk

**Actuation pressure:** air pressure  $P_B =$  \_\_\_\_\_ bar

$P_{max} =$  \_\_\_\_\_ bar

Oil pressure  $P_B =$  \_\_\_\_\_ bar

$P_{max} =$  \_\_\_\_\_ bar

**Series no.** \_\_\_\_\_

**Version characteristics** (e.g. mode of securing plates)

\_\_\_\_\_  
**Machine type:** \_\_\_\_\_

**Working mode:** single stroke  continuous run.

**Motor capacity:**  $P =$  \_\_\_\_\_ kW, at  $n =$  \_\_\_\_\_ min<sup>-1</sup>

**Max. pressing/shearing force**  $F =$  \_\_\_\_\_ kN

**Working angle at BDC**  $\alpha =$  \_\_\_\_\_ deg.

**Working height at BDC**  $h =$  \_\_\_\_\_ mm

**Eccentric radius**  $r =$  \_\_\_\_\_ mm

**Length of the connecting rod**  $l =$  \_\_\_\_\_ mm

**Eccentric speed**  $n_E =$  \_\_\_\_\_ min<sup>-1</sup>

**Clutching speed**  $n_K =$  \_\_\_\_\_ min<sup>-1</sup>

(state switching speed without fail)

**Individual strokes per minute**  $z =$  \_\_\_\_\_ min<sup>-1</sup>

**Moment of inertia of all masses to be braked**  $J =$  \_\_\_\_\_ kgm<sup>2</sup>

(without clutch and flywheel)

about the clutch shaft axis

Course of  $J$ , if this changes \_\_\_\_\_

**Ram mass including tool**  $m =$  \_\_\_\_\_ kg

if not included in  $J$

**Load torque at braking**  $M_L =$  \_\_\_\_\_ Nm

**Course of  $M_L$  if this changes** \_\_\_\_\_

**Desired braking angle**  $\gamma =$  \_\_\_\_\_ deg.

**Desired braking time**  $t_{Br} =$  \_\_\_\_\_ s

**Envisaged solenoid valve** \_\_\_\_\_

**Flywheel external diameter**  $D_S =$  \_\_\_\_\_ mm