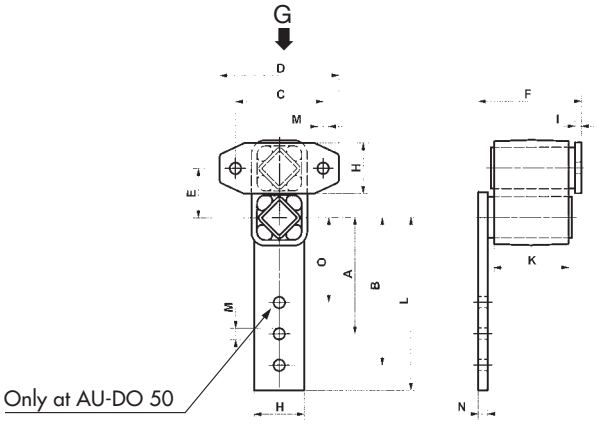
Oscillating Mounting

Type AU-DO



Technical Data (for free oscillating systems, only)

Art. No.	Type	n_{err} = 740 min^{-1} sw	c_d	G	n_{err} = 980 min^{-1} sw	c_d	G	n_{err} = 1460 min^{-1} sw	c_d	G
07 301 001	AU-DO 18	*	*	*	4	140	145	3	125	105
07 301 002	AU-DO 27	*	*	*	5	160	240	4	155	150
07 301 003	AU-DO 38	8	190	520	7	200	395	*	*	*
07 301 004	AU-DO 45	10	240	930	8	260	690	*	*	*
07 301 005	AU-DO 50	11	350	1420	9	370	1040	*	*	*

* = not recommendable
sw = max. amplitude in mm (peak to peak)
c_d = dynamic stiffness in N/mm, by ment. rpm. and amplitude
G = max load capacity in N per AU-DO element by the mentioned rpm and double amplitude (sw).
Nomogram for speed calculation, see table on page 67, below
Rocker arms for higher loads and different drive parameters are available on specific request.

Material Structure

The double housings for sizes 18 up to 45 are made out of light alloy profiles, the ones from size 50 in nodular cast. The rocker arms, inner squares and flanges in steel. All steel parts are galvanized and yellow passivated.

Dimensions

Art. Nr.	Type	A	B	C	D	E	F	H	I	K	L	M	N	O	Weight in kg
07 301 001	AU-DO 18	110	130	60	85	31	73	35	5	50	150	9.5	8	–	1.10
07 301 002	AU-DO 27	120	150	80	110	44	83	45	5	60	175	11.5	8	–	1.85
07 301 003	AU-DO 38	135	170	100	140	60	108	60	6	80	200	14	10	–	2.80
07 301 004	AU-DO 45	160	205	130	180	73	136	70	8	100	240	18	12	–	6.05
07 301 005	AU-DO 50	185	235	140	190	78	165	80	10	120	275	18	15	135	9.75

The AU-DO rockers have mainly been developed as trough suspensions for **counter-frame excited two-mass oscillating systems with continuous material feeding,** driven by two unbalanced motors (see also example on page 73). The chassis **m¹** is excited by unbalanced motors and the spring accumulator units of the AU-DO mountings amplify the small oscillation amplitudes onto the screen or the conveyor trough **m².** The chassis of the machine has to be installed on low frequency mounts, ideally on ROSTA oscillating mountings type AB. These shaker systems are characterized by extremely low, hardly measurable residual force transmission to the machine foundations and are hence ideally suited for installation on steel scaffolding and false floors in processing building. Additional benefits of this system are the nearly noiseless running of the shaker, the low consumption of electric power and the easy installation of the spring accumulators.
Finally, the universal rocker arms from ROSTA are applicable in **crank-driven oscillating conveyor systems.** Here they have the function of trough guide and spring accumulator unit at the same time. This unique machine component is allowing to design different types of resonant shaking systems.

Oscillating Mounting

Type AU-DO

Free Oscillating Shaker System "Silent Flow"

Basics:

Two mass oscillating system with energetic amplification of trough mass (m_2)

Driven by two unbalanced motors

Amplitude fine-tuning by inverter

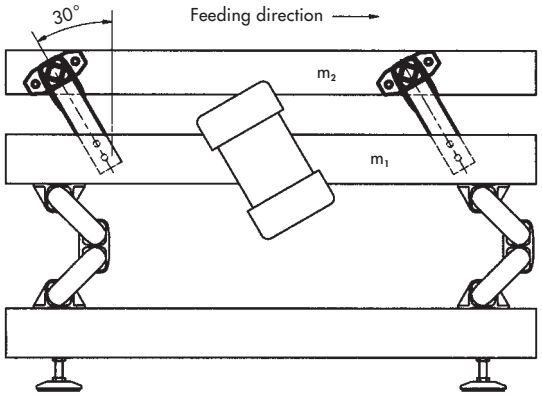
General Parameters:

Center distances between trough suspensions (depending on structure stiffness) — $m = 1–1.5$ m

Ratio $m_1 : m_2$ — $m_1 = 3 \cdot m_2$ (ideal); $m_1 = 2 \cdot m_2$ (minimum)

Basics of element selection:

(Please check also formulas point 3.1, page 52)



Total spring value [N/mm]

$$c_t = \frac{m_1 \cdot m_2}{m_1 + m_2} \cdot \left(\frac{2\pi}{60} \cdot n_{err}\right)^2 \cdot 0.001$$

Quantity of required suspensions (AU-DO) for shaking function in resonance

$$z = \frac{c_t}{0.9 \cdot c_d}$$

Oscillating machine factor [–]

$$K = \frac{\left(\frac{2\pi}{60} \cdot n_{err}\right)^2 \cdot sw}{9810 \cdot 2}$$

Total required centrifugal force of motor [N]

$$F_z = z \cdot c_d \cdot \frac{sw}{2}$$

in using two unbalanced motors

$$\frac{F_z}{2}$$

Calculation Example

Given:

Required material speed v_{th}	= 20 cm/sec approx.
Weight of countermass m_1, with motors	= 92 kg
Weight of empty trough m_2	= 30 kg
Material weight on trough on m_2	= 8 kg
Effective coupling weight 20 %	= 1.6 kg
Total weight of trough m_2	= 31.6 kg
Ratio mass $m_1 : m_2$	= 2.9
Length of trough	= 1.2 m

Selection of the suspensions:

Excitation frequency n_{err}	= 1460 min^{-1}
Excitation amplitude sw	= 4 mm
Theoretical material speed v_{th} (see diagram on page 67)	= 25 cm/sec
Oscillating machine factor K	= 4.8
Total dynamic spring value c_t	= 550 N/mm
Dynamic spring value for selection of suspensions c_t (reserve included)	= 611 N/mm
Quantity of suspensions type AU-DO 27 (c_d 155 N/mm)	= 4 (4 · 155 = 620 N/mm)

Please check in table "technical data" on previous page, if the suspensions AU-DO 27 have the static load capacity fo the mentioned mass (31.6 · 9.81 : 4 = 77.5 N and max. capacity of the element is 150 N)

Required centrifugal force per unbalanced motor* = 620 N

Selection of the supports AB under m_1

$$G = \frac{(m_1 + m_2) \cdot g}{quantity\ AB} = \frac{(92 + 31.6) \cdot 9.81}{4} = 303\ N = 4 \cdot AB\ 27$$

*(system with 2 motors)