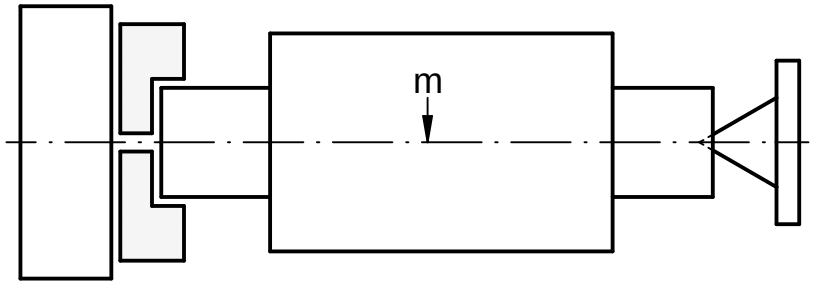
Dimensioning- Calculation for Power Clamping Screw MSP / MSPD

JAKOB Antriebstechnik

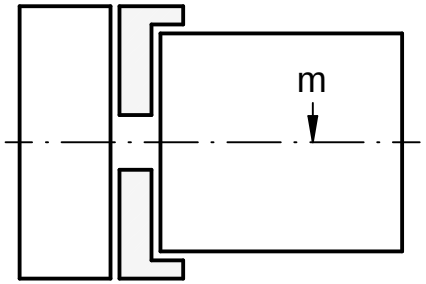
<u>case 1:</u>

$F_m = \frac{m}{2}$



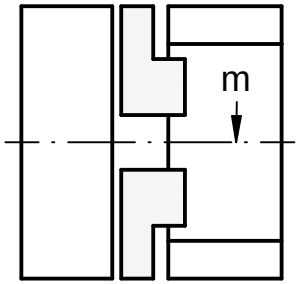
<u>case 2:</u>

$F_m = m$

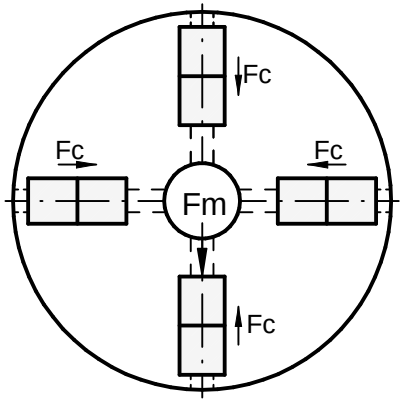


<u>case 3:</u>

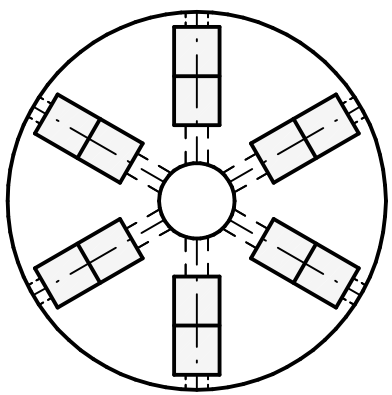
$F_m = m$



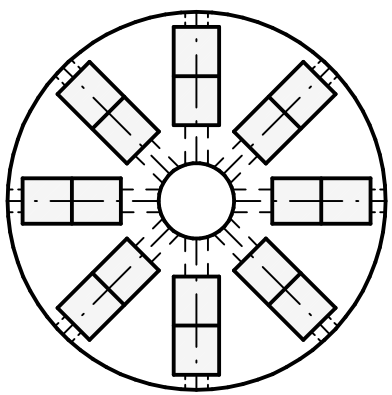
n=4 → f_n=1



n=6 → f_n=1,5



n=8 → f_n=2



MSP size	F_{sn} [kN] external /internal	$F_{smax.}$ [kN]
65	180 / 100	250
80	220 / 140	300
100	270 / 180	400
120	400 / 220	700
160	500 / 300	1100
200	600 / 400	1800

The total amount of clamping force and weight of the working piece has to be less than the value of the max. allowed static load "Fs max":

$$F_{total} = \frac{F_m}{f_n} + F_c \leq F_{smax} \quad \text{or} \quad F_s\,max - F_c^{*} \geq \frac{F_m}{f_n}$$

* <u>Remark:</u> The clamping force Fc should not succeed the nominal clamping force Fsn of the respective Power Clamping Screw size; reduced clamping force values are permitting a higher workpiece weight. Generally it is to say that Fc = Fsn. Specific application factors (unbalanced mass...) have to be respected.

F_c → required clamping force per Power Clamping Screw [kN]

F_{sn} → nominal clamping force of the Power Clamping Screw [kN]

F_{smax} → max. allowed static load [kN]

n → number of Power Clamping Screws per face plat

f_n → load factor (for adversial load distribution)

m → weight of the workpiece [kg bzw. to]

F_m → weight of workpiece in [kN] [1to ≙ 10kN]

<u>Calculation example:</u> max. weight of workpiece: 80 to = 800 kN; case 1: Fm = m/2 = 40to ≙ 400kN; number of Power Clamping Scews: 4 → fn =1
necessary clamping force (50% of the $F_{sn\ external}$) Fc = 200 kN;
External clamping → series MSP

According to the clamping force - preselection of type MSP 120: Fs max - Fc = 700 - 200 = 500 kN and Fm / fn = 400 / 1 = 400 kN i.e. the sizing condition of 500 kN > 400 kN is complied → Sizing is OK!