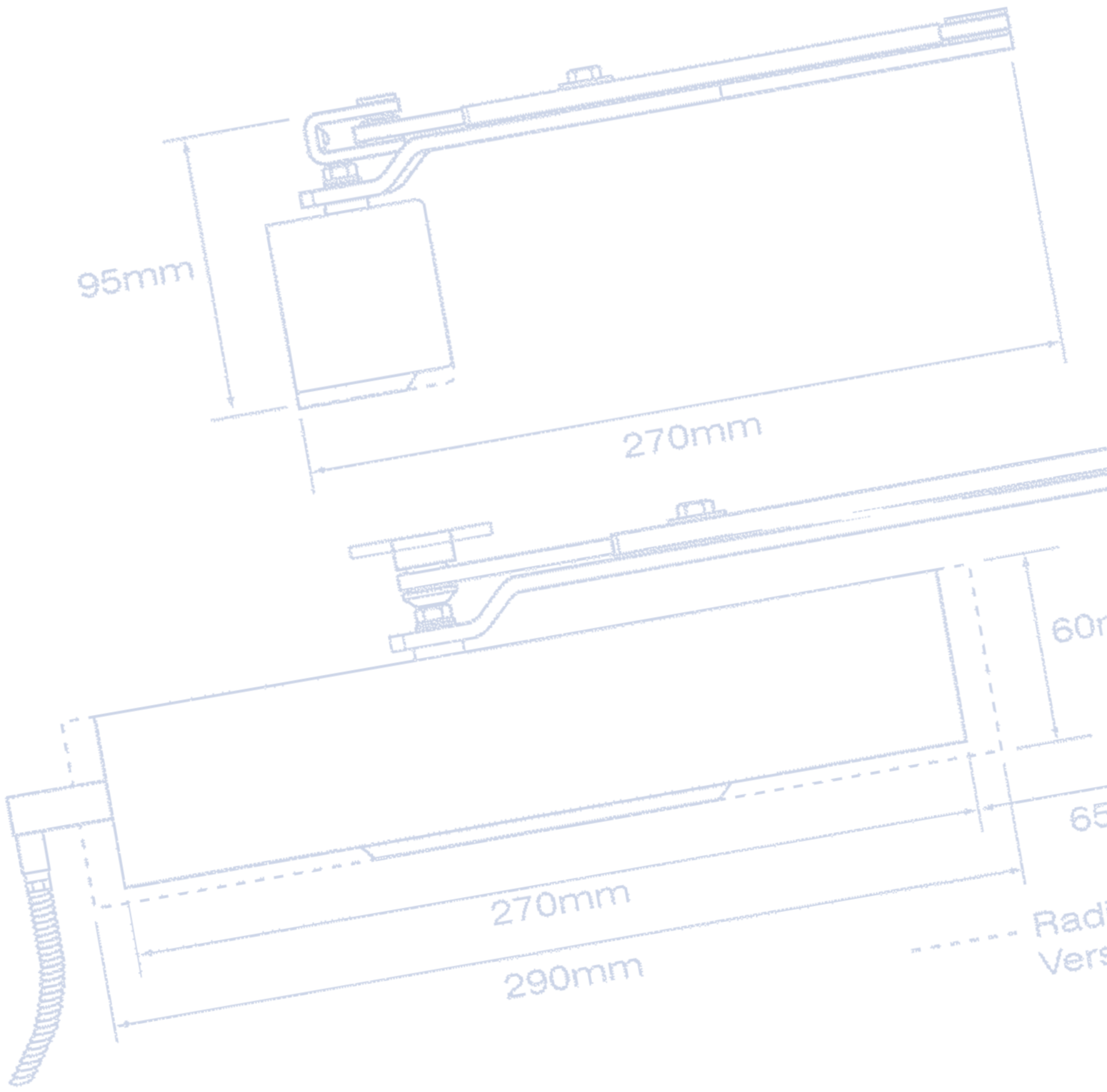




OPENING FORCES APPROVED DOCUMENT M and BS 8300



WHAT YOU NEED TO KNOW



ADJUSTABLE POWER DOOR O



A guide to the latest on door closer forces?

The latest amendments to BS8300 and Approved Document 'M' mean that door closers must not be too difficult to open but, in case fire, be capable of closing the door and keeping it closed. An extract from the guidance is shown below :

“For disabled people to have independent access through single or double swing doors, the opening force, when measured at the leading edge of the door, should be not more than 30N from 0° (the door in the closed position) to 30° open, and not more than 22.5N from 30° to 60° of the opening cycle.”

Which closers can achieve this?

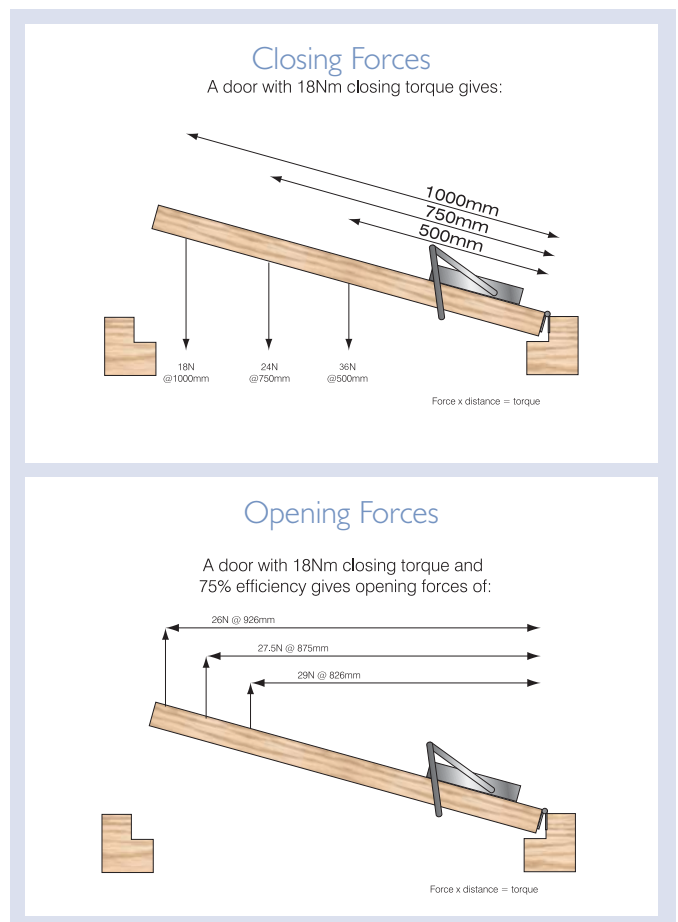
Most adjustable power closers can achieve this low opening force. The problem is that for fire doors EN 1154, the performance standard for door closers states the minimum closing torque should be 18 Newton metres (Nm). This guide provides advice and examples of how to overcome this problem.

What is the difference between a Newton and a Newton metre?

- A Newton metre is the torque measured at 1 metre from the pivot point (hinge).
- Not many doors are exactly 1 metre wide so you have to calculate this.
- If the door is 926mm wide and you measure the closing force at the handle which is 900mm from the hinge, you

may get a reading of 20.5N.

- To convert this to Newton metres you have to multiply it by the distance to the pivot point in metres: $20.5\text{N} \times 0.9 = 18.45\text{Nm}$.
- This would show that the closer was achieving a low size 3 - the minimum recommended for a fire door.
- You could then measure the opening force in Newtons in the same way to see if the door is within the requirement - 30N.
- You do not need to recalculate for Nm as the requirement for opening forces is just in Newtons.



Opening forces greater than 30N?

If an opening force is greater than 30N, the door set will not meet the necessary requirements. There are a number of reasons why this may be the case:

- The hinges are poor or badly fitted
- A seal is interfering with the opening / closing force
- Air pressure is adversely affecting the result
- The closer is not efficient enough

Door closer efficiency

Efficiency is the difference between the opening force and the closing force measured in the final 4° of closing and is expressed as a percentage. So, if we take our 926mm wide door with a closing force of 20.5N and an opening force of 34.5N the efficiency is:

$$(20.5 \div 34.5) \times 100 = 59.42\%$$

This closer is not efficient enough. It is recommended that closers need to be at least 65% efficient. At 65% efficiency with a closing force of 18.45Nm the opening force would be:

$$18.45\text{Nm} \div 0.9\text{m} \div 0.65 = 31.5\text{N}$$

Whilst this is over the 30N limit, you are allowed to increase the forces by 2N because it is difficult to measure right at the edge of the door.

Under Approved Document M the minimum clear opening width of a door on an existing doorway is 750mm. This means that the door is likely to be 826mm. At this width, for an opening force of 30N with 18Nm of closing force, the door closer would need to be at least 73% efficient.

$$(18\text{Nm}^1 \div 0.826\text{m}^2) = 21.79\text{N}^3 \div 30\text{N}^4 \times 100 = 72.6\%$$

- 1 closing moment (torque)
- 2 door width
- 3 closing force at 0.826m
- 4 opening force at 0.826m

Below: Closer efficiency table

Door width (mm)	826	850	875	900	926
Minimum efficiency (%)	73	71	69	67	65

Assuming that the efficiency is adequate, you then need to check that the opening force is no more than 22.5N when the door is at and above 30°.

If the closer has backcheck, you need to make sure that the force from the backcheck does not prevent the door from opening to the minimum clear opening width.

Ask for the manufacturer/supplier to provide the following information:

- Closer efficiency, (see table at foot of page)
- Evidence showing that the opening force falls appropriately before 30° open
- Evidence showing the detail in figure 1 (projecting arm) and figure 6 (parallel arm)
- Confirmation that the readings were taken when the closer was new or after it had been cycled 5000 times. (Door closers usually perform better after they have been cycled). Under EN1154, the efficiency is measured at 5000 cycles, but your end users will want ease of opening from day 1
- Confirmation that any efficiency readings are made at minimum power size 3 - 18Nm. It is important that the efficiency readings are given at this power size, as door closers exhibit greater efficiency at higher power sizes - but the door will be harder to open.
- This information is stronger if it is established by a recognised third party test laboratory such as Warrington APT.

There is a very simple answer to the question 'what door controls should I select to be sure my specification is meeting all the requirements of Approved Document M and BS8300?'

The answer is Jebron adjustable power door closers and floor springs.

Approved Document M & BS8300 Jebroon Door Closer Range

Listed below are the references for the Jebroon door closers suitable for use on all doors above 826mm under the requirements of Approved Document M and BS8300. All these closers are CE marked and 'CERTIFIRE' approved and are suitable for use on fire doors and non-fire doors.

4900, universal door closer, 2 - 5 adjustable

9900, universal door closer, 2 - 5 adjustable

4930, universal door closer, 2 - 5 adjustable with backcheck

9930, universal door closer, 2 - 5 adjustable with backcheck

The above mentioned closers are CE marked under reference:

1121 - CPD- AD0065 and Certificate CFI14

2950, 1 - 4 adjustable floorspring with backcheck.

The above mentioned floor spring is CE marked under reference:

1121 - CPD- AD0066 and Certificate CFI55

9870, universal hold-open, swing free electro-hydraulic door closer

4870, universal hold-open, swing free electro-hydraulic door closer

The above mentioned closers are CE marked under reference:

1121 - CPD- AE0005 and Certificate CFI14

3470, electro-hydraulic floorspring

The above mentioned floor spring is CE marked under reference:

1121 - CPD- AE0004 and Certificate CFI55

Delayed action options are available on all of the above closers.



The Dual power e-mag

Jebroon has developed a unique addition to the electro-magnetic family of door closers. Selective use of electro-magnetic devices are recommended under Approved Document M and our references are shown above. It is recognised that hold-open or swing free are not always appropriate. Jebroon overhead e-mags are particularly suitable as they encompass all functions in one simple, easy to install unit.

This innovative product functions as a normal door closer, closing the door after each operation, but with very low forces. Opening forces on an 826mm wide door can be as low as 12N. This is the ultimate in door control operating ease. High closing forces are achieved (above 27Nm) when the fire alarm is activated, ensuring that the door closes and is kept closed when it is really needed.

This product is so revolutionary that there is no provision for its testing under EN 1154 or 1155. It is tested as far as possible in line with the requirements of these standards and produced in the Jebroon factory, under the Factory Production Control of Warrington APT.

further details are available on request

ADJUSTABLE POWER DOOR C

Awkward Questions

What do I do with a door wider than 950mm?

As yet there is no official guidance on this. However, under EN1154, doors wider than 950mm should be controlled by a size 4 door closer with a minimum closing force 26Nm. For example, even with a 75% efficient closer this would result in an opening force of $(26\text{Nm} \div 0.950\text{m}) \div 75\% = 36.5\text{N}$, which is too high for Approved Document M.

It is unclear as to why EN1154 recommend higher forces for bigger doors, as it has been argued that size 3 is the minimum requirement for fire doors. Therefore you should be able to use this on any size of door.

To be certain, we would recommend consulting with the Architect, Building Control Officer and Fire Officer with this suggestion:

Actual closing force on a 950mm wide door with a minimum size 3 closer is about 19N, providing the door closes adequately, you could adjust the closer to this force at the leading edge of any door wider than 950mm and providing the closer is at least 65% efficient, the opening force would not exceed 30N.

What do I do if I use a recommended closer for a given door width but the opening force still exceeds 30N?

1. Check the closer is adjusted properly.
2. Disconnect the closer and check to see how much force is required to open the door without the closer. The seals, hinges, air pressure or other factors may be affecting the opening force and need to be addressed.
3. Call the door closer supplier!

Where can I get a force meter from and how do I use it?

Force meters accurate enough to measure these forces are likely to be digital and expensive. You can get them from RS Components and other specialist suppliers, however, we recommend that you have a demonstration on how to use a force meter to measure door opening and closing forces!

For more information, help, guidance and high efficiency door closers for all Document 'M', BS 8300 applications please contact us at:

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In accordance with our policy of constant improvement in design, we reserve the right to alter specifications without prior notice.

Designed and manufactured in the UK