



# WRM

## Constant volumeregelaars

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## WRM

### Introductie

WRM luchtvolumeregelaars zijn geschikt voor air conditioning en ventilatiesystemen en kunnen zowel horizontaal als verticaal worden gemonteerd in aan- en afvoerkanalen. De omkasting en het regelmechanisme zijn gemaakt van verzinkt plaatstaal. De centraal ondersteunde regelklep, die het luchtvolume regelt, heeft een centrale dragende as in speciale bussen. Regeleenheid met draaibare wijzer is voorzien van schaalverdeling en blokkering voor de gewenste instelling van het debiet. Instellen kan handmatig of met een actuator. WRM luchtvolumeregelaars zijn mechanische regelaars voor een constant luchtvolume en hebben geen stroombron nodig. Een speciaal regelmechanisme garandeert nauweurige regeling over het hele luchthoeveelheidsbereik. Voor alle modellen is het bereik minstens 5 maal het minimum luchtvolume. Binnen het bereik, dat met Vmin en Vmax wordt aangegeven, kan het gewenste luchtvolume worden ingesteld. Het luchtdebit wordt constant gehouden bij variërende druk binnen het gespecificeerde drukbereik, bij een afwijking die ongeveer ligt tussen  $\pm 5\%$  en  $\pm 10\%$ . Bij een lager luchtdebit kunnen, vooral bij de kleinere modellen, de afwijkingen groter zijn.



WRM



WRMD

### Productomschrijving:

- **WRM** Een mechanische luchtvolumeregelaar voor een constante luchthoeveelheid in ventilatie- en air conditioningsystemen
- **WRM/M** Luchtvolumeregelaar waarbij de gewenste luchthoeveelheid door middel van een motor wordt ingesteld.
- **WRMD** Luchtvolumeregelaar met geluidsisolatie voor het verlagen van het afgestaald geluid

### Eigenschappen

- Luchthoeveelheidsbereik  $V_{min} = 45$  tot  $V_{max} = 5200$  m<sup>3</sup>/h
- Drukbereik 50 tot 1000 Pa
- Lekdichtheidsclassificatie Klasse C volgens EN 1751 (DIN v24194-2)
- Standaard voorzien van rubberen afdichtingsring
- Intern temperatuurbereik -20 tot + 70 °C, 90 °C voor korte tijd

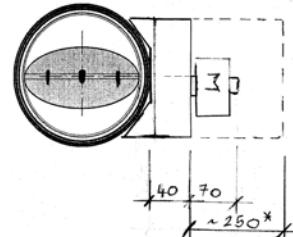
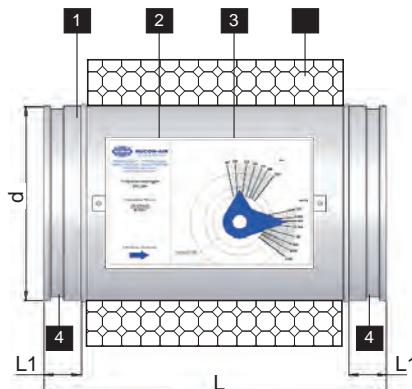
### Opties

- Actuator 230 V wisselstroom of 24 V gelijkstroom of wisselstroom met twee luchthoeveelheidsinstellingen
- Continu-actuator met traploze instelling van het luchtvolume
- Externe geluidsisolatie met plaatstalen mantel

# Technische gegevens WRM Constant volumeregelaars



- 1 Ronde mantel
- 2 Regeleenheid
- 3 Aanwijzer met schaalverdeling
- 4 Afdichtingsring
- 5 Geluidsisolatie met plaatstalen mantel (optie)

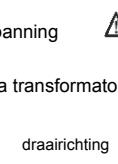


## Motorbediening

**M-2P-24V:** Motor voor gelijk- of wisselstroom geschikt voor twee luchthoeveelheids instellingen(24V AC/DC).

**Motor:** BELIMO - LM 24A.

- Let op: Netspanning
- Aansluiten via transformator



**M-2P-230V:** Motor voor wisselstroom geschikt voor twee luchthoeveelheids instellingen

**Motor:** (230V AC). BELIMO - LM 230A.

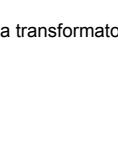
- Let op: Netspanning



**M-SR-24V:** Motor voor gelijk- of wisselstroom met traploze instelling (24V AC/

**Motor:** DC). BELIMO - LM 24A-SR.

- Aansluiten via transformator



| Maten<br>[DN] | Vmin<br>[m <sup>3</sup> /h] | Vmax<br>[m <sup>3</sup> /h] | Vmin<br>[l/s] | Vmax<br>[l/s] | Ø d<br>[mm] | L<br>[mm] | L1<br>[mm] |
|---------------|-----------------------------|-----------------------------|---------------|---------------|-------------|-----------|------------|
| 80            | 45                          | 210                         | 12,5          | 60            | 78          | 320       | 38         |
| 100           | 70                          | 325                         | 20            | 90            | 98          | 320       | 38         |
| 125           | 110                         | 510                         | 30            | 145           | 123         | 320       | 38         |
| 160           | 180                         | 825                         | 50            | 230           | 158         | 320       | 38         |
| 200           | 285                         | 1300                        | 80            | 360           | 198         | 350       | 38         |
| 250           | 450                         | 2030                        | 125           | 565           | 248         | 410       | 47         |
| 315           | 700                         | 3325                        | 195           | 925           | 313         | 460       | 47         |
| 400           | 1130                        | 5200                        | 310           | 1450          | 398         | 460       | 60         |

## Selectietabellen

### Constant volumeregelaars

#### WRM



#### Selectie voorbeeld

#### WRM

| Afmetingen DN | Snelheid m/s | Luchtheveelheid m³/h | dP=100Pa       |       |       |      |      |                      |          |       |       |       | dP=200Pa       |      |      |          |       |                      |       |      |      |      |          |    |    |    |    |    |     |     |
|---------------|--------------|----------------------|----------------|-------|-------|------|------|----------------------|----------|-------|-------|-------|----------------|------|------|----------|-------|----------------------|-------|------|------|------|----------|----|----|----|----|----|-----|-----|
|               |              |                      | Luchtgeluid Lw |       |       |      |      | Afgestaald geluid Lw |          |       |       |       | Luchtgeluid Lw |      |      |          |       | Afgestaald geluid Lw |       |      |      |      |          |    |    |    |    |    |     |     |
|               |              |                      | 125Hz          | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz                 | L (dB) A | 125Hz | 250Hz | 500Hz | 1kHz           | 2kHz | 4kHz | L (dB) A | 125Hz | 250Hz                | 500Hz | 1kHz | 2kHz | 4kHz | L (dB) A |    |    |    |    |    |     |     |
| 80            | 3            | 55                   | 30             | 25    | 25    | 27   | 30   | 30                   | 36       | -     | -     | -     | -              | -    | -    | <25      | 36    | 31                   | 31    | 33   | 36   | 36   | 42       | -  | -  | -  | -  | -  | <25 |     |
|               | 4            | 73                   | 34             | 30    | 30    | 31   | 34   | 33                   | 40       | -     | -     | -     | -              | -    | -    | <25      | 39    | 35                   | 35    | 36   | 39   | 38   | 45       | 21 | 17 | 17 | 18 | 21 | 20  | 27  |
|               | 6            | 110                  | 42             | 40    | 40    | 40   | 42   | 40                   | 48       | 24    | 22    | 22    | 22             | 24   | 22   | 30       | 46    | 44                   | 44    | 44   | 46   | 44   | 52       | 29 | 27 | 27 | 27 | 29 | 27  | 35  |
|               | 10           | 180                  | 50             | 50    | 50    | 49   | 50   | 49                   | 56       | 34    | 34    | 34    | 33             | 34   | 33   | 40       | 52    | 52                   | 52    | 51   | 52   | 51   | 58       | 37 | 37 | 37 | 36 | 37 | 36  | 43  |
|               | 12           | 218                  | 53             | 54    | 54    | 53   | 53   | 52                   | 59       | 37    | 38    | 38    | 37             | 37   | 36   | 43       | 56    | 57                   | 57    | 56   | 56   | 55   | 62       | 40 | 41 | 41 | 40 | 40 | 39  | 46  |
| 100           | 3            | 80                   | 32             | 27    | 27    | 29   | 32   | 32                   | 38       | -     | -     | -     | -              | -    | -    | <25      | 39    | 34                   | 34    | 36   | 39   | 39   | 45       | -  | -  | -  | -  | -  | -   | <25 |
|               | 4            | 106                  | 36             | 32    | 32    | 33   | 36   | 35                   | 42       | -     | -     | -     | -              | -    | -    | <25      | 42    | 38                   | 38    | 39   | 42   | 41   | 48       | 24 | 20 | 20 | 21 | 24 | 23  | 30  |
|               | 6            | 160                  | 42             | 40    | 40    | 40   | 42   | 40                   | 48       | 24    | 22    | 22    | 22             | 24   | 22   | 30       | 47    | 45                   | 45    | 45   | 47   | 45   | 53       | 30 | 28 | 28 | 28 | 30 | 28  | 36  |
|               | 8            | 213                  | 46             | 45    | 45    | 45   | 46   | 44                   | 52       | 30    | 29    | 29    | 29             | 30   | 28   | 36       | 50    | 49                   | 49    | 49   | 50   | 48   | 56       | 35 | 34 | 34 | 34 | 35 | 33  | 41  |
|               | 10           | 266                  | 49             | 49    | 49    | 48   | 49   | 48                   | 55       | 34    | 34    | 34    | 33             | 34   | 33   | 40       | 52    | 52                   | 52    | 51   | 52   | 51   | 58       | 38 | 38 | 38 | 37 | 38 | 37  | 44  |
| 125           | 12           | 319                  | 51             | 52    | 52    | 51   | 51   | 50                   | 57       | 39    | 40    | 40    | 39             | 39   | 38   | 45       | 55    | 56                   | 56    | 55   | 55   | 54   | 61       | 41 | 42 | 42 | 41 | 41 | 40  | 47  |
|               | 3            | 126                  | 40             | 35    | 35    | 37   | 40   | 40                   | 46       | -     | -     | -     | -              | -    | -    | <25      | 47    | 42                   | 42    | 44   | 47   | 47   | 53       | 28 | 23 | 23 | 25 | 28 | 28  | 34  |
|               | 4            | 168                  | 42             | 38    | 38    | 39   | 42   | 41                   | 48       | 25    | 21    | 21    | 22             | 25   | 24   | 31       | 49    | 45                   | 45    | 46   | 49   | 48   | 55       | 30 | 26 | 26 | 27 | 30 | 29  | 36  |
|               | 6            | 252                  | 46             | 44    | 44    | 44   | 46   | 44                   | 52       | 30    | 28    | 28    | 28             | 30   | 28   | 36       | 52    | 50                   | 50    | 50   | 52   | 50   | 58       | 34 | 32 | 32 | 32 | 34 | 32  | 40  |
|               | 8            | 336                  | 49             | 48    | 48    | 48   | 49   | 47                   | 55       | 32    | 31    | 31    | 31             | 32   | 30   | 38       | 54    | 53                   | 53    | 53   | 54   | 52   | 60       | 37 | 36 | 36 | 36 | 37 | 35  | 43  |
| 160           | 10           | 421                  | 51             | 51    | 51    | 50   | 51   | 50                   | 57       | 34    | 34    | 34    | 33             | 34   | 33   | 40       | 56    | 56                   | 56    | 55   | 56   | 55   | 62       | 40 | 40 | 40 | 39 | 40 | 39  | 46  |
|               | 12           | 505                  | 53             | 54    | 54    | 53   | 53   | 52                   | 59       | 37    | 38    | 38    | 37             | 37   | 36   | 43       | 57    | 58                   | 58    | 57   | 57   | 56   | 63       | 42 | 43 | 43 | 42 | 42 | 41  | 48  |
|               | 3            | 209                  | 41             | 36    | 36    | 38   | 41   | 41                   | 47       | 28    | 23    | 23    | 25             | 28   | 28   | 34       | 48    | 43                   | 43    | 45   | 48   | 48   | 54       | 33 | 28 | 28 | 30 | 33 | 33  | 39  |
|               | 4            | 279                  | 43             | 39    | 39    | 40   | 43   | 42                   | 49       | 30    | 26    | 26    | 27             | 30   | 29   | 36       | 50    | 46                   | 46    | 47   | 50   | 49   | 56       | 35 | 31 | 31 | 32 | 35 | 34  | 41  |
|               | 6            | 418                  | 46             | 44    | 44    | 44   | 46   | 44                   | 52       | 32    | 30    | 30    | 30             | 32   | 30   | 38       | 53    | 51                   | 51    | 51   | 53   | 51   | 59       | 38 | 36 | 36 | 36 | 38 | 36  | 44  |
| 200           | 8            | 557                  | 47             | 46    | 46    | 46   | 47   | 45                   | 53       | 34    | 33    | 33    | 33             | 34   | 32   | 40       | 55    | 54                   | 54    | 54   | 55   | 53   | 61       | 40 | 39 | 39 | 39 | 40 | 38  | 46  |
|               | 10           | 697                  | 49             | 49    | 49    | 48   | 49   | 48                   | 55       | 36    | 36    | 36    | 35             | 36   | 35   | 42       | 57    | 57                   | 57    | 56   | 57   | 56   | 63       | 42 | 42 | 42 | 41 | 42 | 41  | 48  |
|               | 12           | 836                  | 51             | 52    | 52    | 51   | 51   | 50                   | 57       | 38    | 39    | 39    | 38             | 38   | 37   | 44       | 58    | 59                   | 59    | 58   | 58   | 57   | 64       | 43 | 44 | 44 | 43 | 42 | 42  | 49  |
|               | 3            | 328                  | 42             | 37    | 37    | 39   | 42   | 42                   | 48       | 29    | 24    | 24    | 26             | 29   | 29   | 35       | 49    | 44                   | 44    | 46   | 49   | 49   | 55       | 35 | 30 | 30 | 32 | 35 | 35  | 41  |
|               | 4            | 439                  | 44             | 40    | 40    | 41   | 44   | 43                   | 50       | 31    | 27    | 27    | 28             | 31   | 30   | 37       | 51    | 47                   | 47    | 48   | 51   | 50   | 57       | 37 | 33 | 33 | 34 | 37 | 36  | 43  |
| 250           | 6            | 658                  | 47             | 45    | 45    | 45   | 47   | 45                   | 53       | 34    | 32    | 32    | 32             | 34   | 32   | 40       | 54    | 52                   | 52    | 52   | 54   | 52   | 60       | 40 | 38 | 38 | 38 | 40 | 38  | 46  |
|               | 8            | 877                  | 49             | 48    | 48    | 48   | 49   | 47                   | 55       | 35    | 34    | 34    | 34             | 35   | 33   | 41       | 56    | 55                   | 55    | 55   | 56   | 54   | 62       | 42 | 41 | 41 | 42 | 40 | 40  | 48  |
|               | 10           | 1097                 | 51             | 51    | 51    | 50   | 51   | 50                   | 57       | 36    | 36    | 36    | 35             | 36   | 35   | 42       | 57    | 57                   | 57    | 56   | 57   | 56   | 63       | 43 | 43 | 43 | 42 | 42 | 49  | 49  |
|               | 12           | 1316                 | 52             | 53    | 53    | 52   | 52   | 51                   | 58       | 38    | 39    | 39    | 38             | 38   | 37   | 44       | 59    | 60                   | 60    | 59   | 59   | 58   | 65       | 44 | 45 | 45 | 44 | 44 | 43  | 50  |
|               | 3            | 517                  | 43             | 38    | 38    | 40   | 43   | 43                   | 49       | 29    | 24    | 24    | 26             | 29   | 29   | 35       | 49    | 44                   | 44    | 46   | 49   | 49   | 55       | 36 | 31 | 31 | 33 | 36 | 36  | 42  |
| 315           | 4            | 690                  | 44             | 40    | 40    | 41   | 44   | 43                   | 50       | 31    | 27    | 27    | 28             | 31   | 30   | 37       | 51    | 47                   | 47    | 48   | 51   | 50   | 57       | 37 | 33 | 33 | 34 | 37 | 36  | 43  |
|               | 6            | 1034                 | 49             | 47    | 47    | 47   | 49   | 47                   | 55       | 35    | 33    | 33    | 33             | 35   | 33   | 41       | 55    | 53                   | 53    | 53   | 55   | 53   | 61       | 41 | 39 | 39 | 39 | 41 | 39  | 47  |
|               | 8            | 1379                 | 51             | 50    | 50    | 50   | 51   | 49                   | 57       | 37    | 36    | 36    | 36             | 37   | 35   | 43       | 57    | 56                   | 56    | 57   | 57   | 55   | 63       | 44 | 43 | 43 | 44 | 42 | 40  | 50  |
|               | 10           | 1724                 | 53             | 53    | 53    | 52   | 53   | 52                   | 59       | 40    | 40    | 40    | 39             | 40   | 39   | 46       | 59    | 59                   | 59    | 59   | 59   | 58   | 65       | 46 | 46 | 46 | 45 | 46 | 45  | 52  |
|               | 12           | 2069                 | 54             | 55    | 55    | 54   | 54   | 53                   | 60       | 42    | 43    | 43    | 42             | 42   | 41   | 48       | 60    | 61                   | 61    | 60   | 60   | 59   | 66       | 47 | 48 | 48 | 47 | 47 | 46  | 53  |
| 400           | 3            | 1336                 | 45             | 40    | 40    | 42   | 45   | 45                   | 51       | 34    | 29    | 29    | 31             | 34   | 34   | 40       | 52    | 47                   | 47    | 49   | 52   | 52   | 58       | 40 | 35 | 35 | 37 | 40 | 40  | 46  |
|               | 4            | 1782                 | 46             | 42    | 42    | 43   | 46   | 45                   | 52       | 36    | 32    | 32    | 33             | 36   | 35   | 42       | 54    | 50                   | 50    | 51   | 54   | 53   | 60       | 42 | 38 | 38 | 39 | 42 | 41  | 48  |
|               | 6            | 2672                 | 51             | 49    | 49    | 49   | 51   | 49                   | 57       | 39    | 37    | 37    | 37             | 39   | 37   | 45       | 58    | 56                   | 56    | 56   | 58   | 56   | 64       | 46 | 44 | 44 | 44 | 46 | 44  | 52  |
|               | 8            | 3563                 | 53             | 52    | 52    | 52   | 53   | 51                   | 59       | 41    | 40    | 40    | 41             | 39   | 37   | 47       | 59    | 58                   | 58    | 58   | 59   | 57   | 65       | 49 | 48 | 48 | 48 | 49 | 47  | 55  |
|               | 10           | 4454                 | 56             | 56    | 56    | 55   | 56   | 55                   | 62       | 44    | 44    | 44    | 43             | 44   | 43   | 50       | 61    | 61                   | 61    | 60   | 60   | 67   | 51       | 51 | 51 | 50 | 51 | 50 | 57  |     |
|               | 12           | 5345                 | 58             | 59    | 59    | 58   | 58   | 57                   | 64       | 47    | 48    | 48    | 47             | 47   | 46   | 53       | 63    | 64                   | 64    | 63   | 63   | 62   | 69       | 53 | 54 | 54 | 53 | 53 | 52  | 59  |

| Afmetingen DN | Correctiewaarde voor afgestaald geluid indien voorzien van isolatie (in dB) |       |       |      |      |      |  |  |  |  |
|---------------|---|-------|-------|------|------|------|--|--|--|--|
|               | 125Hz   | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz |  |  |  |  |

# Selectietabellen

## Constant volumeregelaars

### WRM



#### Selectie voorbeeld

##### WRM

| Afmettingen DN | Snelheid in m/s | Luchthoeveelheid m³/h | dP=400Pa       |       |       |      |      |      |                       |       |       |       |      |      | dP=800Pa       |          |       |       |       |      |                       |      |          |       |       |       |      |      |      |          |
|----------------|-----------------|-----------------------|----------------|-------|-------|------|------|------|-----------------------|-------|-------|-------|------|------|----------------|----------|-------|-------|-------|------|-----------------------|------|----------|-------|-------|-------|------|------|------|----------|
|                |                 |                       | Luchtgeluid Lw |       |       |      |      |      | Afgestraald geluid Lw |       |       |       |      |      | Luchtgeluid Lw |          |       |       |       |      | Afgestraald geluid Lw |      |          |       |       |       |      |      |      |          |
|                |                 |                       | 125Hz          | 250Hz | 500Hz | 1KHz | 2KHz | 4KHz | L (dB) A              | 125Hz | 250Hz | 500Hz | 1KHz | 2KHz | 4KHz           | L (dB) A | 125Hz | 250Hz | 500Hz | 1KHz | 2KHz                  | 4KHz | L (dB) A | 125Hz | 250Hz | 500Hz | 1KHz | 2KHz | 4KHz | L (dB) A |
| 80             | 3               | 55                    | 42             | 37    | 37    | 39   | 42   | 42   | 48                    | 24    | 19    | 19    | 21   | 24   | 24             | 30       | 48    | 43    | 43    | 45   | 48                    | 48   | 54       | 39    | 44    | 44    | 42   | 39   | 39   | 33       |
|                | 4               | 73                    | 45             | 41    | 41    | 42   | 45   | 44   | 51                    | 26    | 22    | 22    | 23   | 26   | 25             | 32       | 50    | 46    | 46    | 47   | 50                    | 49   | 56       | 31    | 27    | 27    | 28   | 31   | 30   | 37       |
|                | 6               | 110                   | 50             | 48    | 48    | 48   | 50   | 48   | 56                    | 33    | 31    | 31    | 31   | 33   | 31             | 39       | 54    | 52    | 52    | 52   | 54                    | 52   | 60       | 37    | 35    | 35    | 35   | 37   | 35   | 43       |
|                | 10              | 180                   | 56             | 56    | 56    | 55   | 56   | 55   | 62                    | 40    | 40    | 40    | 39   | 40   | 39             | 46       | 59    | 59    | 59    | 58   | 59                    | 58   | 65       | 44    | 44    | 44    | 43   | 44   | 43   | 50       |
|                | 12              | 218                   | 58             | 59    | 59    | 58   | 58   | 57   | 64                    | 43    | 44    | 44    | 43   | 43   | 42             | 49       | 61    | 62    | 62    | 61   | 61                    | 60   | 67       | 47    | 48    | 48    | 47   | 47   | 46   | 53       |
|                | 3               | 80                    | 46             | 41    | 41    | 43   | 46   | 46   | 52                    | 28    | 23    | 23    | 25   | 28   | 28             | 34       | 52    | 47    | 47    | 49   | 52                    | 52   | 58       | 33    | 28    | 28    | 30   | 33   | 33   | 39       |
| 100            | 4               | 106                   | 49             | 45    | 45    | 46   | 49   | 48   | 55                    | 31    | 27    | 27    | 28   | 31   | 30             | 37       | 54    | 50    | 50    | 51   | 54                    | 53   | 60       | 37    | 33    | 33    | 34   | 37   | 36   | 43       |
|                | 6               | 160                   | 52             | 50    | 50    | 50   | 52   | 50   | 58                    | 36    | 34    | 34    | 34   | 36   | 34             | 42       | 57    | 55    | 55    | 55   | 57                    | 55   | 63       | 41    | 39    | 39    | 39   | 41   | 39   | 47       |
|                | 8               | 213                   | 55             | 54    | 54    | 54   | 55   | 53   | 61                    | 40    | 39    | 39    | 39   | 40   | 38             | 46       | 60    | 59    | 59    | 59   | 60                    | 58   | 66       | 45    | 44    | 44    | 44   | 45   | 43   | 51       |
|                | 10              | 266                   | 57             | 57    | 57    | 56   | 57   | 56   | 63                    | 42    | 42    | 42    | 41   | 42   | 41             | 48       | 61    | 61    | 61    | 60   | 61                    | 60   | 67       | 47    | 47    | 47    | 46   | 47   | 46   | 53       |
|                | 12              | 319                   | 59             | 60    | 60    | 59   | 59   | 58   | 65                    | 45    | 46    | 46    | 45   | 45   | 44             | 51       | 62    | 63    | 63    | 62   | 62                    | 61   | 68       | 49    | 50    | 50    | 49   | 49   | 48   | 55       |
|                | 3               | 126                   | 52             | 47    | 47    | 49   | 52   | 52   | 58                    | 33    | 28    | 28    | 30   | 33   | 33             | 39       | 58    | 53    | 53    | 55   | 58                    | 58   | 64       | 39    | 34    | 34    | 36   | 39   | 39   | 45       |
| 125            | 4               | 168                   | 54             | 50    | 50    | 51   | 54   | 53   | 60                    | 36    | 32    | 32    | 33   | 36   | 35             | 42       | 60    | 56    | 56    | 57   | 60                    | 59   | 66       | 42    | 38    | 38    | 39   | 42   | 41   | 48       |
|                | 6               | 252                   | 57             | 55    | 55    | 55   | 57   | 55   | 63                    | 40    | 38    | 38    | 38   | 40   | 38             | 46       | 62    | 60    | 60    | 62   | 60                    | 62   | 68       | 45    | 43    | 43    | 43   | 45   | 43   | 51       |
|                | 8               | 336                   | 59             | 58    | 58    | 58   | 59   | 57   | 65                    | 42    | 41    | 41    | 41   | 42   | 40             | 48       | 65    | 64    | 64    | 64   | 65                    | 63   | 71       | 47    | 46    | 46    | 46   | 47   | 45   | 53       |
|                | 10              | 421                   | 61             | 61    | 61    | 60   | 61   | 60   | 67                    | 45    | 45    | 45    | 44   | 45   | 44             | 51       | 66    | 66    | 66    | 65   | 66                    | 65   | 72       | 49    | 49    | 49    | 48   | 49   | 48   | 55       |
|                | 12              | 505                   | 62             | 63    | 63    | 62   | 62   | 61   | 68                    | 46    | 47    | 47    | 46   | 46   | 45             | 52       | 67    | 68    | 68    | 67   | 67                    | 66   | 73       | 51    | 52    | 52    | 51   | 51   | 50   | 57       |
|                | 3               | 209                   | 54             | 49    | 49    | 51   | 54   | 54   | 60                    | 39    | 34    | 34    | 36   | 39   | 39             | 45       | 60    | 55    | 55    | 57   | 60                    | 60   | 66       | 43    | 38    | 38    | 40   | 43   | 43   | 49       |
| 160            | 4               | 279                   | 56             | 52    | 52    | 53   | 56   | 55   | 62                    | 41    | 37    | 37    | 38   | 41   | 40             | 47       | 62    | 58    | 58    | 59   | 62                    | 61   | 68       | 47    | 43    | 43    | 44   | 47   | 46   | 53       |
|                | 6               | 418                   | 59             | 57    | 57    | 57   | 59   | 57   | 65                    | 44    | 42    | 42    | 42   | 44   | 42             | 50       | 65    | 63    | 63    | 65   | 63                    | 63   | 71       | 50    | 48    | 48    | 48   | 50   | 48   | 56       |
|                | 8               | 557                   | 61             | 60    | 60    | 60   | 61   | 59   | 67                    | 46    | 45    | 45    | 45   | 46   | 44             | 52       | 67    | 66    | 66    | 67   | 65                    | 65   | 73       | 51    | 50    | 50    | 50   | 51   | 49   | 57       |
|                | 10              | 697                   | 62             | 62    | 62    | 61   | 62   | 61   | 68                    | 47    | 47    | 47    | 46   | 47   | 46             | 53       | 68    | 68    | 68    | 67   | 68                    | 67   | 74       | 52    | 52    | 52    | 51   | 52   | 51   | 58       |
|                | 12              | 836                   | 64             | 65    | 65    | 64   | 64   | 63   | 70                    | 48    | 49    | 49    | 48   | 48   | 47             | 54       | 70    | 71    | 71    | 70   | 70                    | 69   | 76       | 54    | 55    | 55    | 54   | 54   | 53   | 60       |
|                | 3               | 328                   | 56             | 51    | 51    | 53   | 56   | 56   | 62                    | 41    | 36    | 36    | 38   | 41   | 41             | 47       | 61    | 56    | 56    | 58   | 61                    | 61   | 67       | 46    | 41    | 41    | 43   | 46   | 46   | 52       |
| 200            | 4               | 439                   | 58             | 54    | 54    | 55   | 58   | 57   | 64                    | 43    | 39    | 39    | 40   | 43   | 42             | 49       | 64    | 60    | 60    | 61   | 64                    | 64   | 70       | 49    | 45    | 45    | 45   | 46   | 49   | 55       |
|                | 6               | 658                   | 60             | 58    | 58    | 58   | 60   | 58   | 66                    | 46    | 44    | 44    | 44   | 46   | 44             | 52       | 67    | 65    | 65    | 65   | 67                    | 65   | 73       | 51    | 49    | 49    | 49   | 51   | 49   | 57       |
|                | 8               | 877                   | 62             | 61    | 61    | 61   | 62   | 60   | 68                    | 47    | 46    | 46    | 46   | 47   | 45             | 53       | 68    | 67    | 67    | 68   | 66                    | 66   | 74       | 54    | 53    | 53    | 53   | 54   | 52   | 60       |
|                | 10              | 1097                  | 63             | 63    | 63    | 62   | 63   | 62   | 69                    | 49    | 49    | 49    | 48   | 49   | 48             | 55       | 70    | 70    | 70    | 69   | 70                    | 69   | 76       | 55    | 55    | 55    | 54   | 55   | 54   | 61       |
|                | 12              | 1316                  | 65             | 66    | 66    | 65   | 65   | 64   | 71                    | 50    | 51    | 51    | 50   | 50   | 49             | 56       | 71    | 72    | 72    | 71   | 71                    | 70   | 77       | 56    | 57    | 57    | 56   | 56   | 55   | 62       |
|                | 3               | 517                   | 56             | 51    | 51    | 53   | 56   | 56   | 62                    | 42    | 37    | 37    | 39   | 42   | 42             | 48       | 62    | 57    | 57    | 59   | 62                    | 62   | 68       | 48    | 43    | 43    | 45   | 48   | 48   | 54       |
| 250            | 4               | 690                   | 58             | 54    | 54    | 55   | 58   | 57   | 64                    | 43    | 39    | 39    | 40   | 43   | 42             | 49       | 65    | 61    | 61    | 62   | 65                    | 64   | 71       | 51    | 47    | 47    | 48   | 51   | 50   | 57       |
|                | 6               | 1034                  | 61             | 59    | 59    | 59   | 61   | 59   | 67                    | 47    | 45    | 45    | 45   | 47   | 45             | 53       | 67    | 65    | 65    | 65   | 67                    | 65   | 73       | 54    | 52    | 52    | 52   | 54   | 52   | 60       |
|                | 8               | 1379                  | 63             | 62    | 62    | 62   | 63   | 61   | 69                    | 49    | 48    | 48    | 48   | 49   | 47             | 55       | 69    | 68    | 68    | 69   | 67                    | 65   | 75       | 56    | 55    | 55    | 55   | 56   | 54   | 62       |
|                | 10              | 1724                  | 64             | 64    | 64    | 63   | 64   | 63   | 70                    | 51    | 51    | 51    | 50   | 51   | 50             | 57       | 70    | 69    | 69    | 70   | 68                    | 76   | 58       | 57    | 57    | 56    | 57   | 56   | 63   |          |
|                | 12              | 2069                  | 66             | 67    | 67    | 66   | 66   | 65   | 72                    | 53    | 54    | 54    | 53   | 53   | 52             | 59       | 71    | 71    | 71    | 70   | 71                    | 70   | 77       | 59    | 60    | 59    | 59   | 60   | 58   | 65       |
|                | 3               | 825                   | 57             | 52    | 52    | 54   | 57   | 57   | 63                    | 41    | 36    | 36    | 38   | 41   | 41             | 47       | 64    | 59    | 59    | 61   | 64                    | 64   | 70       | 49    | 44    | 44    | 46   | 49   | 49   | 55       |
| 315            | 4               | 1100                  | 59             | 55    | 55    | 56   | 59   | 58   | 65                    | 44    | 40    | 40    | 41   | 44   | 43             | 50       | 66    | 62    | 62    | 63   | 66                    | 65   | 72       | 52    | 48    | 48    | 49   | 52   | 51   | 58       |
|                | 6               | 1651                  | 62             | 60    | 60    | 60   | 62   | 60   | 68                    | 46    | 44    | 44    | 44   | 46   | 44             | 52       | 68    | 66    | 66    | 68   | 66                    | 74   | 56       | 54    | 54    | 54    | 56   | 54   | 62   |          |
|                | 8               | 2201                  | 64             | 63    | 63    | 63   | 64   | 62   | 70                    | 50    | 49    | 49    | 49   | 50   | 48             | 56       | 70    | 69    | 69    | 70   | 68                    | 76   | 58       | 57    | 57    | 56    | 58   | 56   | 64   |          |
|                | 10              | 2751                  | 65             | 65    | 65    | 64   | 65   | 64   | 71                    | 52    | 52    | 52    | 51   | 52   | 51             | 58       | 71    | 71    | 71    | 70   | 71                    | 70   | 77       | 60    | 60    | 59    | 60   | 59   | 66   | 66       |
|                | 12              | 3301                  | 66             | 67    | 67    | 66   | 66   | 65   | 72                    | 53    | 55    | 55    | 54   | 55   | 54             | 61       | 72    | 73    | 73    | 72   | 72                    | 71   | 78       | 62    | 63    | 63    | 62   | 62   | 61   | 68       |
|                | 3               | 1336                  | 58             | 53    | 53    | 55   | 58   | 58   | 64                    | 42    | 37    | 37    | 39   | 42   | 42             | 48       | 65    | 60    | 60    | 62   | 65                    | 65   | 71       | 51    | 46    | 46    | 48   | 51   | 51   | 57       |
| 400            | 4               | 1782                  | 60             | 56    | 56    | 57   |      |      |                       |       |       |       |      |      |                |          |       |       |       |      |                       |      |          |       |       |       |      |      |      |          |



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