product details

PRO MR 16 20 36° 840 adv

Product description:	PRO MR 16 20 36° 840 adv [1)]
Product code:	4008321972118
Quantity:	Folding carton box (FS) contains 1 Piece (PCE)

You can find this product in the eCatalog:
http://catalog.myosram.com?~language=EN&~country=GB&it_p=4008321972118

Capabilities	
Dimmable	Yes

Country specific categorizations	
ILCOS	DRR-5-12-GU5,3-50/36

Additional product data	
Base (standard designation)	GU5.3
Footnote used only for product	All technical parameters apply to the entire lamp/Due to the complex production process for light-emitting diodes, the typical values shown for the technical LED parameters are purely statistical valu

Colors & materials	
Rated lamp mercury content	0.0 mg
Mercury-free	Yes

Electrical data	
Rated wattage	5 W
Nominal wattage	5 W
Nominal voltage	12 V
Claimed equiv. conventional lamp power	20 W
Rated number of switching cycles	100000
Rated power factor λ	0.95
Operating frequency	50...60 Hz

Dimensions & weight	
Overall length	46.0 mm
Diameter	50.0 mm
Outer bulb	MR51

Lifespan	
Nominal lamp life time	30000 h
Rated lamp life time	30000 h

Light technical data	
Beam angle	36 °
Luminous intensity	720 cd
Nominal luminous flux	290 lm
Rated luminous flux	290 lm
Rated color temperature	4000 K
Rated color rendering index Ra	80
Rated starting time	0.2 s
Rated warm-up time (60 %)	0 s
Lumen main.fact.at end of nom.life time	0.70

Packaging units				
Product code	**Packaging type and content**	**Dimensions in h x w x l**	**Gross weight**	**Volume**
4008321972118	Folding carton box contains 1 Piece	52,000 mm x 52,000 mm x 53,000 mm	59,300 g (0,000 g)	0,143 Cubic dec.
4008321972125	Shipping carton box contains 10 Piece	114,000 mm x 71,000 mm x 271,000 mm	602,000 g (0,000 g)	2,193 Cubic dec.

Product features
• Professional LED lamp • Dimmable (Advanced versions) • High color consistency • Base: GU5.3 • Lifetime: up to 40,000 h • Mercury free lamp
Product benefits
• Very low energy consumption • Extremely long life • No UV and near-IR radiation in the light beam • Shockproof and vibration-proof • Efficient generation of white light
Areas of application
• As a downlight for marking walkways, doors, stairs, etc. • Exhibitions, department stores • Outdoor use in outdoor luminaires only (minimum IP65) • Directional light sources • Museums • Hospitality • Shops
Equipment / Accessories
• Equipped with high-power LEDs • Suitable for many commercially available electronic or conventional transformers
References / Links
For Dimming conformity see www.osram.com/DIMFor further products and actual information concerning LED lamps see www.osram.com/ledlampsFor Guarantee see www.osram.com/guaranteeFurther information see www.osram.de/low-voltage-ledlamps

[1] All technical parameters apply to the entire lamp | Due to the complex production process for light-emitting diodes, the typical values shown for the technical LED parameters are purely statistical values that do not necessarily match the actual technical parameters of each individual product, which can vary from the typical value

PARATHOM® PRO MR16 20 advanced
Product description

- True replacement for MR16 20W halogen lamp
- Dimension comparable to the GU5.3 halogen lamp
- Dimmable down to 10%
- High quality light with a CRI>90

Product Offering

Type reference	Power	CCT	Beam Angle	CRI
MR16 20 24 adv 927	5W	2700K	24°	90
MR16 20 36 adv 927	5W	2700K	36°	90
MR16 20 24 adv 930	5W	3000K	24°	90
MR16 20 36 adv 930	5W	3000K	36°	90
MR16 20 24 adv 840	5W	4000K	24°	80
MR16 20 36 adv 840	5W	4000K	36°	80

1. Key Features and Benefits

- 5W LED lamp as high-quality replacement of 20W-35W halogen lamp
- GU5.3 base
- 12V AC/DC input voltage
- Dimmable[1]
- available in three different colour temperature:
  2700K – warm white
  3000K – warm white
  4000K – cool white
- high colour consistency: <5 Standard Deviation Colour Matching
- reduces energy consumption up to 84%
- shock-proof and vibration-proof
- 30,000 hours lifetime
- UV and NIR radiation free
- Mercury free
- operates with most common conventional and electronic control gear
- 5 years Osram Guarantee[2]

[1] See www.osram.com/dim
[2] See www.osram.com/guarantee

2. Common Characteristics[3]

Average lifetime[4]	Switching cycles (30s on, 30s off)	Casing material	Starting time	Warm up time for 60% light	Power factor
30,000h	1,000,000	Metal/plastic	0.0s	none	0.9

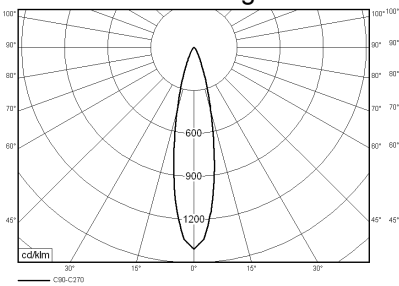
Mercury max.	Base Type	Length	Diameter	Weight	Tc temperature max.[5]	Nominal current	Max. current
0.0mg	GU5.3	46mm	50mm	48g	90°C	0.46A	0.96A

3. Characteristic Range[3]

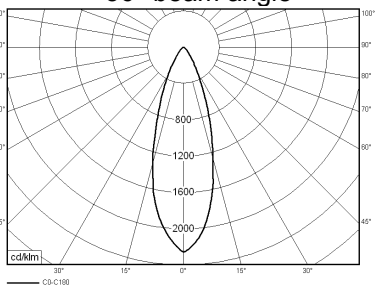
Type reference	Power	Luminous Flux[6]	Luminous intensity[6]	Correlated colour temperature	Standard deviation colour matching	Colour rendering index	Beam angle
MR16 20 24 adv 927	5W	190lm	800cd	2700K	<5	90	24°
MR16 20 36 adv 927	5W	190lm	460cd	2700K	<5	90	36°
MR16 20 24 adv 930	5W	210lm	950cd	3000K	<5	90	24°
MR16 20 36 adv 930	5W	210lm	500cd	3000K	<5	90	36°
MR16 20 24 adv 840	5W	290lm	1100cd	4000K	<5	80	24°
MR16 20 36 adv 840	5W	290lm	720cd	4000K	<5	80	36°

4. Light distribution curve

24° beam angle

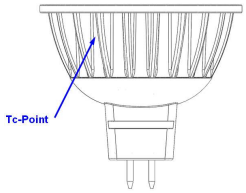


36° beam angle



5. Mounting information

Good heat exchange supports ideal performance



[3] Typical values measured at 12V AC. All the technical parameters apply to the entire lamp. In view of the complex manufacturing process for light emitting diodes, the typical values given above for the technical LED parameters are merely statistical values that do not necessarily correspond to the actual technical parameters of an individual product; individual products may vary from the typical values.

[4] The average lifetime of LED lamps is defined as the number of hours when the light output of 50% of a large group of identical lamps goes below 70% of its initial luminous flux (L70B50, IEC60969).The lifetime is estimated at room temperature (25°C), free air burning, base up burning position and at rated voltage. To achieve a full lifetime a good heat exchange for the electronic components is required.

[5] The Tc is defined as the highest permissible temperature which may occur on the outer surface of the LED lamp (in the indicated position) under normal operating conditions and at the rated voltage/current/power or the maximum of the rated voltage/current/power range (DIN EN 62031: 2009-01)

[6] Measured at 12V DC

6. Disposal information

WEEE-lamps can be returned at specific collection points.
LED lamps have to be disposed as special waste.

7. Application Information

Applications

- hotels
- restaurant
- commercial areas
- residentials
- art galleries and museum
- office space

Application Notes

1. suitable for indoor application.
2. for outdoor applications and operation in damp locations special approved fixture are required.
3. Input voltage:
   AC: 12V
   DC: 10V…24V
4. Operating temperature range between -20°C and 40°C

8. Cost savings: example

Reference product description	Similar halogen product	Watts saved	Cost saved after 1 year	Cost saved after 2 years	Cost saved after 5 years
MR16 20 36 adv 930	MR16 halogen 20W	15W	5€	30€	107€

Based on the assumption of 12hours/day on and an energy cost of 0.19€/kWh

9. Ordering Guide

Type reference	Product Number – 1pcs	Product Number – 1 shipping unit	Number of pcs / ship. unit
MR16 20 24 adv 927	4008321**973252**	4008321**973269**	10
MR16 20 36 adv 927	4008321**972217**	4008321**972224**	10
MR16 20 24 adv 930	4008321**973276**	4008321**973283**	10
MR16 20 36 adv 930	4008321**972095**	4008321**972101**	10
MR16 20 24 adv 840	4008321**973290**	4008321**973306**	10
MR16 20 36 adv 840	4008321**972118**	4008321**972125**	10

10. Lamp conformity

2004/108/EC Electromagnetic compatibility (EMC)
2009/125/EC Ecodesign requirements for energy related products
2011/65/EC Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
1907/2006 Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH Regulation)
2002/96/EC Waste Electrical and Electronic Equipment Directive (WEEE)
EN 62471 Photobiological safety of lamps and lamp systems
IEC/TR 62471-2 Photobiological safety of lamps and lamp systems - Part 2: Guidance on manufactoring requirements relating to non-laser optical radiation safety
EN 55015 Limits and methods of measurement of radio disturance
EN 61000-3-2 Electromagnetic compatibility – Limits for harmonic current emission
EN 61000-3-3 Electromagnetic compatibility – Limitation of voltage changes, voltage fluactuations, flicker in public low voltage supply systems
EN61547 Electromagnetic compatibility immunity requirements

11. Compatibility performance with transformers without dimmer [7]

Status: November 2011

Legend

ET / electronic transformers **MT** / magnetic transformers **OT** / optotronic transformers

G / good **NG** / poor function **N/A** / not applicable

Transformer information			Number of tested lamps (@230V input)				Note
Brand	Model	Type	1	2	3	4	
NA	100VA	MT	G	G	G	G	
OSRAM	ET-MZ 60/110-130	ET	NG	G	G	N/A	
OSRAM	ET-A 60/220-240	ET	G	G	G	N/A	
OSRAM	ET-C 70/220-240	ET	G	G	G	N/A	
OSRAM	ET-Z 60/220-240	ET	G	G	G	N/A	
OSRAM	ET-ZL 50/220-240	ET	G	G	N/A	N/A	
OSRAM	ET-ZE 60/220-240	ET	G	G	G	N/A	
OSRAM	ET-P 60/220-240 (Gen2)	ET	G	G	G	N/A	
OSRAM	ET-Parrot 70/220-240 I	ET	G	G	G	N/A	
OSRAM	ET-Parrot 105/220-240 I	ET	NG	G	G	G	
OSRAM	TET-E60I/220-240	ET	NG	NG	G	N/A	
OSRAM	ET-Redback 60/230-240	ET	G	G	G	N/A	
OSRAM	HTB 70/220-240	ET	G	G	G	N/A	
OSRAM	HTB 105/220-240	ET	G	G	G	G	
OSRAM	HTB 70/230-240	ET	G	G	G	N/A	
OSRAM	HTN 75/230-240 I	ET	NG	G	G	N/A	
OSRAM	HTM 70/230-240	ET	G	G	G	N/A	
OSRAM	HTM 105/230-240	ET	G	G	G	G	
OSRAM	HTM 150/230-240	ET	NG	NG	G	G	
OSRAM	HTL105/230-240	ET	NG	NG	G	G	
OSRAM	OT 12/220-240/10	OT	G	G	N/A	N/A	
OSRAM	OT 15/220-240/10	OT	G	G	N/A	N/A	
OSRAM	OT 50/220-240/10	OT	G	G	G	G	
OSRAM	OTe 35/220-240/12	OT	G	G	G	G	
OSRAM	OT 20/220-240/24	OT	G	G	N/A	N/A	
OSRAM	OT 75/220-240/24	OT	G	G	G	G	
OSRAM	OTe 18/220-240/24	OT	G	G	N/A	N/A	
OSRAM	Hti DALI 105/230-240 DIM	HTi	NG	NG	NG	NG	
OSRAM	Hti DALI 150/220-240 DIM	HTi	NG	NG	NG	NG	
OSRAM	Hti DALI 315/230-240 DIM	HTi	G	G	G	N/A	With HTM70
OSRAM	Hti DALI 315/230-240 DIM	HTi	G	G	G	G	With HTM105
OSRAM	Hti DALI 315/230-240 DIM	HTi	NG	G	G	N/A	With ET-Parrot70
OSRAM	Hti DALI 315/230-240 DIM	HTi	G	G	G	N/A	With ET-Z60
OSRAM	Hti DALI 315/230-240 DIM	HTi	G	G	G	N/A	With ET-A60

[7] Typical values. Test performed exemplary on PARATHOM PRO MR16 20 24 adv 927

The test results reflect the measurement of the individual devices that were used in tests. OSRAM does not take over any responsibility, warranty or liability that this results can also be achieved by using the devices under other conditions or when using successor models of the tested devices or different models of the same manufacturer.

The test results were achieved by using the above mentioned LED-lamp types. OSRAM does not take over any responsibility, warranty or liability that this results can also be achieved by using the devices under other conditions or when using other LED-lamp types.

Transformer information			Number of tested lamps (@230V input)				Note
Brand	Model	Type	1	2	3	4	
SLV	461060	ET	G	G	G	N/A	
SLV	461310	ET	NG	NG	G	G	
BLOCK	HES 70K	ET	G	G	G	N/A	
BLOCK	HES 105K	ET	NG	G	G	G	
EVN	TAB 50(0410)	ET	G	G	N/A	N/A	
EVN	CLOU 60(T41/09)	ET	G	G	G	N/A	
Berker	SNT 70/QU 2918	ET	NG	NG	G	N/A	
Berker	SNTF 105 297401	ET	NG	NG	G	G	
Berker	SNTF II 35-105W 2927	ET	NG	NG	G	G	
Berker	SNT 40 2915	ET	G	G	N/A	N/A	
TCI	PUMA 60	ET	NG	G	G	N/A	
TCI	EF 70	ET	G	G	G	N/A	
TCI	PUMA 105	ET	NG	G	G	G	
Paulmann	Euro S 70	ET	NG	NG	G	N/A	
Paulmann	Profi 50	ET	NG	G	N/A	N/A	
JUNG	SNT 70 Q	ET	NG	G	G	N/A	
JUNG	SNT 40	ET	G	G	N/A	N/A	
JUNG	SNT 70 F	ET	NG	G	G	N/A	
JUNG	SNT 105 F	ET	NG	G	G	G	
nobile	EN-80F	ET	NG	G	G	G	
nobile	EN-60D2	ET	NG	G	G	N/A	
nobile	EN-60D	ET	NG	G	G	N/A	
nobile	EN-35R	ET	G	N/A	N/A	N/A	
Goodbay	SET110LV(35-110W)	ET	NG	NG	G	G	
PHILIPS	Primaline 70 230-240	ET	NG	NG	G	N/A	

12. Dimming behaviours [7]

Status November 2011

Legend	
L / leading edge	**T** / trailing edge
Y / yes	**N** / no

Dimming behaviour with HTM 70 @ Vin= 230V, 50Hz

Dimmer info			Number of lamp under test	Dimming range (%)		Note
Brand	Model	Type		Min	Max	
Berker	Nr. 2874	T	1	14	100	
CONRAD	T46	T	1	23	100	Flickering below 23%
EVERFLO URISH	EFM700DC	T	1	32	100	
ELSO	ATD315(174200)	T	1	40	100	Flickering at ~70%
Busch	6513U-102	T	1	48	100	
Legrand	775903	T	1	11	100	
Merten	577199	T	1	29	100	
EVERFLO URISH	EFO700DC	T	1	42	100	Flickering below 42%
HPM	Cat 400T	T	1	8	100	Flickering below 8%

Dimming behaviour with HTM 105 @ Vin= 230V, 50Hz

Dimmer info			Number of lamp under test	Dimming range (%)		Note
Brand	Model	Type		Min	Max	
Berker	Nr. 2874	T	1	10	100	
CONRAD	T46	T	1	12	100	
EVERFLO URISH	EFM700DC	T	1	30	100	
ELSO	ATD315(174200)	T	1	44	100	
Busch	6513U-102	T	1	51	100	
Legrand	775903	T	1	30	100	Flickering below 30%
Merten	577199	T	1	33	100	
EVERFLO URISH	EFO700DC	T	1	35	100	
HPM	Cat 400T	T	1	5	100	Flickering below 5%

Dimming behaviour with ET-Parrot70 @ Vin= 230V, 50Hz						
Dimmer info			Number of lamp under test	Dimming range (%)		Note
Brand	Model	Type		Min	Max	
Berker	Nr. 2874	T	1	6	100	
CONRAD	T46	T	1	8	100	
EVERFLO URISH	EFM700DC	T	1	25	100	
ELSO	ATD315(174200)	T	1	38	100	
Busch	6513U-102	T	1	46	100	
Legrand	775903	T	1	10	100	Flickering below 10%
Merten	577199	T	1	29	100	
EVERFLO URISH	EFO700DC	T	1	30	100	
HPM	Cat 400T	T	1	0	100	

The lamp shows poor functionality with leading edge dimmers.
Leading edge dimmers not recommended.