### 60/70 WATT RANGE



#### SUMMARY SPECIFICATION

Model Number	Input Voltage	Nominal Voltage	Adjustment Range	Output Current	Cooling	Dimensions
F20170-012		12V	11 – 14.5V	0 – 5A	Convection	- Add The The posed
F20170-013	198 – 264V a.c.	13.8V	11 – 14.5V	0 – 5A	Convection	
F20170-024	or	24V	23 – 28V	0 – 2.5A	Convection	180 x 113.6 x 72.9 mm
F20170-027	or 92 – 132V a.c.	27.2V	23 – 28V	0 – 2.5A	Convection	7.09 x 4.47 x 2.87 in.
F20170-048		48V	46 – 56V	0 – 1.25A	Convection	
F20170-054		54.5V	46 – 56V	0 – 1.25A	Convection	

Line Regulation

#### INPUT SPECIFICATION

INFUTSFECIFICATION		Line Regulation	over the specified input range with the	0	
Input Voltage	198 – 264V a.c. as standard. 92 – 132V a.c. available to order.		output loaded to maximum rated output current.		
Frequency	45 – 65Hz.	Ripple and Noise	1% V <sub>NOM</sub> pk-pk maximum over 100kHz		
Supply Type	Single phase TN-S systems (as defined in IEC364).		bandwidth. 2% V <sub>NOM</sub> pk-pk maximum over 30MHz bandwidth. Measurements		
Efficiency	Typically 75%. Dependant on model and output voltage.		loaded to maximum rated output current.		
Harmonic Distortion	Units are input current corrected to meet the requirements of EN61000-3-2.	Reverse Current Drain	When used for charging batteries but with the mains input turned off, the current drain is less than 2mA.		
OUTPUT SPECIFICATION	V	PROTECTION			
Voltage	Nominal output voltages and adjustment ranges are shown in the summary specification above. Other voltages	Output Current Limit	All units have protection against output overload.		
	available to order.	Output Overvoltage	The output is protected against		
Current	Recommended continuous current ratings (I) are shown in the summary		overvoltage. Overvoltage protection levels are:		
	specification above. All maximum current		12V / 13.8V output 14.8V – 16V;		
	ratings are the guaranteed current		24V / 27.2V output 29V - 33V;		
	available at the nominal output voltage.		48V / 54.5V output 56V – 64V.		
Load Regulation	100mV maximum for an output load variation of 0 to I <sub>MAX</sub> .	Reverse Voltage Protection	For battery charging applications, a diode is fitted across the output to rupture the external battery fuse on reverse		
			the second		

100mV maximum for an input variation

connection.

96

### 60/70 WATT RANGE

1									
	Overtemperature Protection	Self resetting therm	nal protection is	MECHANICAL SPECIFIC	CATION				
	AUXILIARY FUNCTIONS	provided.		Mechanical Format	012, 024 and 048 mode chassis as standard. cover with mains lead	A met is availab	pplied on al mesh ble and is		
	Output Fail	A relay drive output. A operating.	tive low when unit		specified by adding 'M' to the end of the model number.				
	Temperature Compensation	Available as an op automatic output volta	tion. Provides ge adjustment for		013, 027 and 054 mo with cover and mains I	dels are ead as s	provided tandard.		
	wide temperature ra applications.		e battery charging	Mounting Orientation Ventilation and Cooling	Units may be mounted Units are convection c	in any or ooled and	ientaion. d require		
	Indicator	A green LED ON Indi	cator is provided.		free airflow over all fac	es.			
	ISOLATION			ENVIRONMENTAL CON	DITIONS				
	Input to Output	Reinforced insulation for one minute. Complete to 1.5kV a.c. between	to 3kV a.c. r.m.s. ete units are tested input and output	Operating Temperature Operating Humidity	0 to 40°C at full rated o 0 to 90% R.H. non-cor	output po idensing.	wer.		
		together and connecte	inals connected INTERNATIONAL SAFETY		<b>YSTANDARDS</b>				
96	Output to Earth	Units are tested to 500 output to earth, with a	IV a.c. r.m.s. from Il output terminals	/ a.c. r.m.s. from output terminals Units have been designed in EN60950 and EN60335-2-29		n accordance with the requirements of 9 (where applicable).			
		connected together.		CE marked to the Low V	oltage Directive.				
CO	ELECTROMAGNETICCO	<i>APATIBILITY</i>		When fitted with a cover, units are CE marked to the Low Voltage Directive and the EMC Directive for stand alone battery chargers.					
C-I	Exported Noise	Units meet the requirer curve B and EN55014 (	nents of EN55022 where applicable)	ORDERING INFORMATION					
A	Immunity	Units meet the re	a radiated noise.	The order code consists of	of 4 fields:				
UT		EN50082-1.	squiremente or	1. Source code: 14					
Р				2. Series: F2017	70				
- I				3. Version: 012, 0	013, 024, 027, 048 or 054				
0	<b>OUTLINE DRAWING</b>			4. Cover option M (sta	andard on 013, 027 and 0	54)	d maina		
ш	All dimensions are nominal and	d are given in mm (inches).		lead, the order code is:	o with 240 output with a	cover an	u mains		
GL	External Dimensions 180 (	7.09) x 113.6 (4.47) x 72.9 (	(2.87).	13 F20170 024 / M					
Z	Mass 1kg (	2.2lb).	Carlos de la carlo		and the second second				
S	annets contraction before	a .			a				
	Contract President Investor	Ĭ		877		Γ			
	second in the second second								
	Dates and March		INPUT			UIPUI	-		
	INCLIT			ki zi zi		L			
	INPOT			OUTPUT			00000		
	$\odot$		11/1/						
	news a good call to be	a (	k		a				
		E	Sale and	D	σ	С	State		
				- restance multiple analysis					
	Fixings 4 x 5	mm diameter holes are	-	A	Din	n mm	in		
	provid	5mm diameter holes are vided on the chassis flanges d are marked 'a' on the line drawing		altigrant in maning	A	180.0	7.09		
	and				В	113.6	4.47		
	Connectors The f	following connectors are			C	72.9	2.87		
	provi	ded on the power supply:	0	UTPUT ON	D	190.0	7.48		
	Input 1/4" F	east-on spades or flying with M option and on 013.		0	Pyro mod aniw E	5.0	0.20		
	027 a	and 054 models.			F	92.0	3.62		
	Output 1/4" F	ast-on spades.			G	9.4	0.37		

### 120/140 WATT RANGE



#### SUMMARY SPECIFICATION

Model Number	Input Voltage	Nominal Voltage	Adjustment Range	Output Current	Cooling	Dimensions
F20171-012		12V	11 – 14.5V	0 – 10A	Convection	
F20171-013		13.8V	11 – 14.5V	0 – 10A	Convection	-
F20171-024	198 – 264V a.c.	24V	23 – 28V	0 – 5A	Convection	200 x 113.6 x 75.9 mm
F20171-027	or 92 – 132V a.c.	27.2V	23 – 28V	0 – 5A	Convection	7.87 x 4.47 x 2.99 in.
F20171-048		48V	46 – 56V	0 – 2.5A	Convection	
F20171-054		54.5V	46 – 56V	0 – 2.5A	Convection	and the second second

#### INPUT SPECIFICATION

Model Number	Input Voltage	Nominal Voltage	Adjustment Range	Output Current	Cool	ling	Dimensions	
F20171-012	and the second se	12V	11 – 14.5V	0 – 10A	Conve	ection		
F20171-013		13.8V	11 – 14.5V	0 – 10A	Conve	ection		
F20171-024	198 – 264V a.c.	24V	23 – 28V	0 – 5A	Conve	ection	200 x 113.6 x	75.9 mm
F20171-027	or 92 – 132V a c	27.2V	23 – 28V	0 – 5A	Conve	ection	7.87 x 4.47 x 2	2.99 in.
F20171-048	52 - 102 v 4.0.	48V	46 – 56V	0 – 2.5A	Conve	ection		
F20171-054		54.5V	46 – 56V	0 – 2.5A	Conve	ection		Sec.
NPUT SPECIFICA nput Voltage Frequency Supply Type Efficiency Harmonic Distortior	CATION 198 – 264V a.c. as standard. 92 – 132V a.c. available to order. 45 – 65Hz. Single phase TN-S systems (as defined in IEC364). Typically 75%. Dependant on model and output voltage. tion Units are input current corrected to meet the requirements of EN61000.2.2			Line Regulation	se nt Drain	100m over t the o outpu 1% V bandy over 3 are m loade When with th drain	V maximum for a he specified inpu- utput loaded to t current. <sub>NOM</sub> pk-pk maxim vidth. 2% V <sub>NOM</sub> 30MHz bandwidth hade differentially d to maximum rat used for charg he mains input turr is less than 2mA	an input variatio it range and wit maximum rate um over 100kH pk-pk maximur Measurement with the output ed output current ing batteries but hed off, the current
OUTPUT SPECIFIC	CATION			PROTECTION				
Voltage	Nominal o ranges a specificat	utput voltages re shown in ion above.	and adjustment the summary Other voltages	Output Current Limit All units have protection ag overload.		on against outpu		
Current	available to order Recommended continuous current			Output Overvol	tage	The overv levels	output is pro oltage. Overvo are:	tected agains oltage protection
specification above. All maximum current				12V /	13.8V output	14.8V – 16V;		
	ratings are the guaranteed current					24V /	27.2V output	29V – 33V;
Load Regulation	available at the nominal output voltage. 100mV maximum for an output load variation of 0 to I <sub>MAX</sub> .			Reverse Voltage Protection	e	48V/ For ba is fitte exter	54.5V output attery charging ap ed across the out mal battery fu ection.	56V – 64V. plications, a diod put to rupture th se on revers

# 120/140 WATT RANGE

	Overtemperature Protection	Self resetting internal th is provided.	ermal protection	MECHANICAL SPECIFIC	ICATION			
	AUXILIARY FUNCTIONS			Mechanical Format	012, 024 and 048 models are supplied on chassis as standard. A metal mesi			
	Output Fail A relay drive output. Active loperating.		ive low when unit		specified by add model number.	s lead is available and is ding 'M' to the end of the		
	Temperature Compensation	Available as an opti automatic output voltage	on. Provides e adjustment for		013, 027 and 0 with cover and r	54 models are supplied mains lead as standard.		
		applications.	battery charging	Mounting Orientation	Units may be mo	ounted in any orientation.		
	Indicator	A green LED 'ON' indica	ator is provided.	ventilation and cooling	free airflow over	all faces.		
	ISOLATION	*		ENVIRONMENTAL CONI	DITIONS			
	Input to Output	Reinforced insulation to	3kV a.c. r.m.s.	Operating Temperature	0 to 40°C at full	rated output power.		
		to 1.5kV a.c. between in	nput and output	Operating Humidity	0 to 90% R.H. non-condensing.			
		together and connected	to earth	INTERNATIONAL SAFET	Y STANDARDS			
98	Output to Earth	Units are tested to 500V output to earth, with all o	a.c. r.m.s. from output terminals	Units have been designe EN60950 and EN60335-2	d in accordance w -29 (where applica	vith the requirements of able).		
		connected together.		CE marked to the Low V	oltage Directive.			
CO	ELECTROMAGNETIC CO	MPATIBILITY		When fitted with a cover, Directive and the EMC D	units are CE mark Directive for stand	alone battery chargers.		
A C - I	Exported Noise	Units meet the requireme Curve B and EN55014 (w	ents of EN55022 here applicable)	ORDERING INFORMATION				
_	Immunity	Units meet the req	uirements of	The order code consists o	of 4 fields:			
5		EN50082-1.		1. Source code: 14				
Р				2. Series: F2017	'1			
. 1 0				4. Options a) Cov	ver option M (s	or 054 tandard on 013, 027 and		
0	OUTLINE DRAWING			Salard Contain	054)			
GLE	All dimensions are nominal and External Dimensions 200 ( Mass 1 2kg	l are given in mm (inches). 7.87) x 113.6 (4.47) x 70.9 (2.	79).	e.g. to order model F20171 with 24V output and with a cover and mains lead, the order code is:				
Z		(2.9b).			512017102471W	and the full frame		
S		a 🕁		(				
		fering and the			1940 p			
	a ball we had a set		INPLIT		1.14	OUTPUT		
	Sector Black Antonio	<u>ه</u>	277777		LL L			
	INPUT	Prise in the		OUTPUT				
	$\bigcirc$				antitude applicant			
	U					Second Differences		
		E	all and the	D		с		
		in the second second		methody and interest of		endaled i		
		1	and the second	A				
	Fixings 4 x 5 provid	mm diameter holes are led on the chassis flanges		The second strangers and		Dim mm in A 200.0 7.87		
	and a outline	and are marked 'a' on the				B 113.6 4.47		
	Connectors The fo	ollowing connectors are		and the second s		C 75.9 2.99		
	provid	led on the power supply:	O	UTPUT ON		D 210.0 8.27		
	Input 3 x 1/4" lead w 027 a	Fast-on spades or flying vith M option and on 013, nd 054 models.	and the second second	0		E 5.0 0.20 F 92.0 3.62		
	Output 1/4" Fa	ast-on spades.			-	G 9.4 0.37		

# 180/210 WATT RANGE

PFC



#### SUMMARY SPECIFICATION

Model Number	Input Voltage	Nominal Voltage	Adjustment Range	Output Current	Cooling	Dimensions
F20172-012		12V	11 – 14.5V	0 – 15A	Convection	in ) dinsi-
F20172-013		12V	11 – 14.5V	0 – 15A	Convection	
F20172-024	198 – 264V a.c.	24V	23 – 28V	0 – 7.5A	Convection	260 x 113.6 x 84.9 mm
F20172-027	92 – 132V a.c.	24V	23 – 28V	0 – 7.5A	Convection	10.24 x 4.47 x 3.34 in.
F20172-048		48V	46 – 56V	0 – 3.75A	Convection	
F20172-054		48V	46 – 56V	0 – 3.75A	Convection	

#### INPUT SPECIFICATION

198 – 264V a.c. as standard. 92 – 132V a.c. available to order.
45 – 65Hz.
Single phase TN-S systems (as defined in IEC364).
Typically 75%. Dependant on model and output voltage.
Units are input current corrected to meet the requirements of EN61000-3-2.

#### **OUTPUT SPECIFICATION**

Voltage	Nominal output voltages and adjustment ranges are shown in the summary specification above. Other voltages available to order.			
Current	Recommended continuous current ratings (I <sub>MAX</sub> ) are shown in the summary specification above. All maximum current ratings are the guaranteed current available at the nominal output voltage.			
Load Regulation	100mV maximum for an output load variation of 0 to I <sub>MAX</sub> .			

Line Regulation

output loaded to maximum rated output<br/>current.Ripple and Noise1% V\_NOM pk-pk maximum over 100kHz<br/>bandwidth. 2% V\_NOM pk-pk maximum<br/>over 30MHz bandwidth. Measurements<br/>are made differentially with the output

Reverse Cuirrent Drain

#### PROTECTION

Output Current Limit

Output Overvoltage

Reverse Voltage Protection overvoltage. Overvoltage protection levels are: 12V / 13.8V output 14.8V – 16V; 24V / 27.2V output 29V – 33V;

100mV maximum for an input variation

over the specified input range with the

loaded to maximum rated output current. When used for charging batteries but

with the mains input turned off, the current

All units have protection against output

The output is protected against

drain is less than 2mA.

overload.

24V / 27.2V output 29V - 33V; 48V / 54.5V output 56V - 64V.

For battery charging applications, a diode is fitted across the output to rputure the external battery fuse on reverse connection. 99

100

# 180/210 WATT RANGE

	Overtemperature Protection	Self resetting thern provided.	nal protection is	MECHANICAL SPECIFIC	CATION			
	AUXILIARY FUNCTIONS			Mechanical Format	012, 024 and 04 chassis as sta cover with mair	<b>18</b> models are supplied on andard. A metal mesh		
	Output Fail	A relay drive output. A operating.	ctive low when unit		specified by adding 'M' to the end of the model number.			
	Temperature Compensation	Available as an op automatic output volta	otion. Provides age adjustment for		013, 027 and 0 with cover and	054 models are supplied mains lead as standard.		
	Indicator	applications.	e battery charging	Mounting Orientation Ventilation and Cooling	Units may be m Units are conve	ounted in any orientation.		
	ISOLATION	A green LED ON ING	icator is provided.		free airflow ove	r all faces.		
	ISOLATION			ENVIRONMENTAL CONI	DITIONS			
	Input to Output	Reinforced insulation for one minute. Complete 1 Fill/	to 3kV a.c. r.m.s. ete units are tested	Operating Temperature Operating Humidity	0 to 40°C at full 0 to 90% R.H. r	rated output power.		
		with all output term together and connecte	input and output inals connected ed to earth	INTERNATIONAL SAFET	Y STANDARDS			
00	Output to Earth	Units are tested to 500 output to earth, with a	)V a.c. r.m.s. from Il output terminals	Units have been designed	d in accordance	with the requirements of		
		connected together.		CE marked to the Low V	oltage Directive			
C	ELECTROMAGNETIC CO	MPATIBILITY		When fitted with a cover, units are CE marked to the Low Voltage Directive and the EMC Directive for stand alone battery chargers				
C - I	Exported Noise	Units meet the requirer curve B and EN55014 (	ments of EN55022 (where applicable)	ORDERING INFORMATION				
A	les estate in the second s	for both conducted and	d radiated noise.	The order code consists o	f 4 fields:			
F	immunity	EN50082-1.	equirements of	1. Source code: 14	in Thoras.			
Р				2. Series: F2017	2			
T				3. Version: 012, 0	13, 024, 027, 048	or 054		
0	OUTLINE DRAWING			4. Cover option M (sta	ndard on 013, 02	7 and 054)		
ш	All dimensions are nominal and	are given in mm (inches).	(2.24)	e.g. to order model F20172 lead, the order code is:	with 24V output ar	nd with a cover and mains		
NGI	Mass 1.9kg	(4.2lb).	(3.34).	1;	3 F20172 024 / M			
S		a	Sector Sector		a			
	Plant she water in the	θ						
		The ingent of the last			Company of the			
			INPUT		1964	OUTPUT		
	and the second	<u>۵</u>	VIIIA		LL.			
	INPUT		1111	OUTPUT	The frequence			
	( )				parte anti-q	Tel Think and the		
		a				nanogia soderni -		
		Banavat nagri			1			
		E		D	U	С		
				None trains of the station of				
				A				
	Fixings 4 x 5	mm diameter holes are				Dim mm in		
	provid	ded on the chassis flanges are marked 'a' on the		and the second market of		A 260.0 10.24		
	outlin	outline drawing.		and the boundary is the		B 113.6 4.47		
	Connectors The f	ollowing connectors are ded on the power supply:		a statistic formation of the state		C 84.9 3.34		
	Input 1/4" F	ast-on spades or flying	OUTPUT ON			D 270.0 10.63		
	lead mode	with M option and on Is 013, 027 and 054.		0		F 92.0 3.62		
	Output 1/4" F	ast-on spades.			-	G 9.4 0.37		

# 300/350 WATT RANGE



#### SUMMARY SPECIFICATION

Model Number	Input Voltage	Nominal Voltage	Adjustment Range	Output Current	Cooling	Dimensions
F20173-012		12V	11 – 14.5V	0 – 25A	Convection	140 Minut
F20173-013	~	13.8V	11 – 14.5V	0 – 25A	Convection	
F20173-024	198 – 264V a.c. or 92 – 132V a.c.	24V	23 – 28V	0 – 12.5A	Convection	310 x 144.6 x 97.9 mm
F20173-027		27.2V	23 – 28V	0 – 12.5A	Convection	12.20 x 5.69 x 3.85 in.
F20173-048		24V	23 – 28V	0 – 12.5A	Convection	
F20173-054		54.5V	46 – 56V	0 - 6.25A	Convection	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -

#### INPUT SPECIFICATION

Input Voltage	198 – 264V a.c. as standard. 92 – 132V a.c. available to order.
Frequency	45 – 65Hz.
Supply Type	Single phase TN-S systems (as defined in IEC364).
Efficiency	Typically 75%. Dependant on model and output voltage.
Harmonic Distortion	Units are input current corrected to meet the requirements of EN61000-3-2.

#### OUTPUT SPECIFICATION

Voltage	Nominal output voltages and adjustment ranges are shown in the summary specification above. Other voltages available to order.			
Current	Recommended continuous current ratings ( $I_{MAX}$ ) are shown in the summary specification above. All maximum current ratings are the guaranteed current available at the nominal output voltage.			
Load Regulation	100mV maximum for an output load variation of 0 to I <sub>MAX</sub> .			

Line	Regulation	
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Ripple and Noise

100mV maximum for an input variation over the specified input range with the output loaded to maximum rated output current.

1%  $V_{\text{NOM}}$  pk-pk maximum over 100kHz bandwidth. 2%  $V_{\text{NOM}}$  pk-pk maximum over 30MHz bandwidth. Measurements are made differentially with the output loaded to maximum rated output current.

When used for charging batteries but with the mains input turned off, the current drain is less than 2mA.

All units have protection against output

The output is protected against

overvoltage. Overvoltage protection

14.8V - 16V;

29V - 33V;

overload.

levels are:

12V / 13.8V output

24V / 27.2V output

#### PROTECTION Output Current Limit

Reverse Current Drain

Output Overvoltage

Reverse Voltage Protection

48V / 54.5V output 56V - 64V. For battery charging applications, a diode is fitted across the output of rupture the external battery fuse on reverse connection. 101

# 300/350 WATT RANGE

	Overtemprature Protection	Self resetting thermal protection is provided.	MECHANICAL SPECIFIC	CATION		
	AUXILIARY FUNCTIONS		Mechanical Format	Mechanical Format 012, 024 and 048 models are supplied chassis as standard. A metal m		
	Output Fail	A relay drive output. Active low when unit operating.		cover with mains lead is available and is specified by adding 'M' to the end of the model number. 013, 027 and 054 models are supplied with cover and mains lead as standard.		
	Temperature Compensation	Available as an option. Provides automatic output voltage adjustment for wide temperature range battony charging				
	Indicator	applications. A green LED 'ON' indicator is provided	Mounting Orientation Ventilation and Cooling	Units may be mo Units are convector	unted in any orientation. ction cooled and require	
	ISOLATION			free arritow over	all faces.	
	BOLAHON		ENVIRONMENTAL CONDITIONS			
	Input to Output Reinforced insulation to 3kV a.c. r.m.s for one minute. Complete units are teste to 1.5kV a.c. between input and output with all output		Operating Temperature Operating Humidity	0 to 40°C at full rated output power. 0 to 90% R.H. non-condensing.		
		together and connected to earth	INTERNATIONAL SAFET	TY STANDARDS		
102	Output to Earth	utput to Earth Units are tested to 500V a.c. r.m.s. from output to earth, with all output terminals		Units have been designed in accordance with the requirements of EN60950 and EN60335-2-29 (where applicable).		
		connected together.	CE marked to the Low Voltage Directive.			
AC-DC	ELECTROMAGNETIC CO	MPATIBILITY	When fitted with a cover, units are CE marked to the Low Voltage Directive and the EMC Directive for stand alone battery chargers			
	Exported Noise	Units meet the requirements of EN55022 curve B and EN55014 (where applicable) for both conducted and radiated paiso	ORDERING INFORMATIC	DN .	,	
	Immunity Units meet the requirements of EN50082-1.		The order code consists of 4 fields:			
UT			1. Source code: 14			
٩			2. Series: F2017:	3		
L J			3. Version: 012, 013, 024, 027, 048 or 054			
0	OUTLINE DRAWING		4. Cover option M (standard on 013, 027 and 054)			
ш	All dimensions are nominal and are given in mm (inches).		e.g. to order model F20173 with 24V output with a cover and mains lead, the order code is:			
-	External Dimensions 310 (12.20) x 144.6 (5.69) x 97.9 (3.85).		13 F20173 024 / M			
NIS	Fixings 2.5kg Fixings 4 x 5 flang	g (5:6). imm diameter holes are provided on the chassis les and are marked 'a' on the outline drawing.				
0,			- Martin Contractor	]		
				1715-51-57		
		a		ф <u>а</u>		
	In the second second					
		INPUT		1 65 46	OUTPUT	
	INDUT		[//]	1 LL		
			OUTPUT			
		a + (////)				
			)	0	C	
		A		1	Dim mm in	
	Connectors The following		Contract Real Products		A 310.0 12.20	
	connectors provided	are and the states and the states are state			B 144.6 5.69	
	power supply	y:			C 97.9 3.85	
Input 1/4" Fast-on spades		spades ad with	and the second provide the second		D 320.0 12.60	
	option M and	lon 013,	)		E 5.0 0.20	
027 and 054 models. Output M4 screws.		models.		_	G 9.4 0.37	