

Customer: ALPS EUROPE DISTRIBUTION

No. ECR2009-6582

Date: Feb. 16, 2009

Attention:

Your ref. No.:

Your Part No.: STEC11B03

SPECIFICATIONS

ALPS';

MODEL: EC11B152442D

Spec. No.:

Sample No.: F 7 3 7 4 6 9 7 M

RECEIPT STATUS

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By Date

Signature

Name

Title

ALPS
ALPS ELECTRIC CO., LTD.

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B2579

Q1003#03A (EA)

S P E C I F I C A T I O N S

1. THIS SPECIFICATIONS APPLY TO EC11B152442D ROTARY ENCODERS.

2. CONTENTS OF THIS SPECIFICATIONS.

F7374697M
LA211446S
4K-1

3. MARKING

- MARKING ON ALL UNITS
EIA DATE CODE

4. REMARKS

- FURNISH PACKAGE
NUT:1 WASHER:1

• CAUTION

1. For the export of products which are controlled items subject to foreign and domestic export laws and regulations, you must obtain approval and/or follow the formalities of such laws and regulations.

2. Products must not be used for military and/or antisocial purposes such as terrorism, and shall not be supplied to any party intending to use the products for such purposes.

3. Unless provided otherwise, the products have been designed and manufactured for application to equipment and devices which are sold to end-users in the market, such as AV (audio visual) equipment, home electric equipment, office and commercial electronic equipment, information and communication equipment or amusement equipment. The products are not intended for use in, and must not be used for, any application of nuclear equipment, driving control equipment for aerospace or any other unauthorized use.

With the exception of the above mentioned banned applications, for applications involving high levels of safety and liability such as medical equipment, burglar alarm equipment, disaster prevention equipment and undersea equipment, please contact an Alps sales representative and/or evaluate the total system on the applicability. Also, implement a fail-safe design, protection circuit, redundant circuit, malfunction protection and/or fire protection into the complete system for safety and reliability of the total system.

4. Before using products which were not specifically designed for use in automotive applications, please contact an Alps sales representative.

5. The products shall be stored in the original packaging and kept at room temperature and humidity, out of direct sunlight, and away from any and all corrosive gas. The products shall be completely used as soon as possible, but no later than 6 months from the date of delivery.

Once product packaging is opened, the complete quantity of such products shall be promptly used.

CLASS NO.	TITLE
	1.1形回転形エンコーダ規格書 11mm Size Rotary Encoder Specification

1. 一般事項 General (SW01), (SW02)
 - 1-1 適用範囲 SCOPE
この仕様書は主として電子機器用11mm形ロータリエンコーダに適用する。
This specification applies to 11mm size low-profile rotary encoder (incremental type) for microscopic current circuits, used in electronic equipment.
 - 1-2 標準状態 Standard atmospheric conditions
測定は特定条件のもとで行い、次の状態で行う。
Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests, is as follows:
温度 Ambient temperature : 15°C to 35°C
相対湿度 Relative humidity : 25% to 85%
気圧 Air pressure : 86kPa to 106kPa
但し、試験を主として行なう場合は、次の標準状態で行なう。
If there is any doubt about the results, measurements shall be made within the following limits:
温度 Ambient temperature : 20 ± 1°C
相対湿度 Relative humidity : 63% to 67%
気圧 Air pressure : 86kPa to 106kPa
1-3 使用温度範囲 Operating temperature range : -40°C to +85°C
 - 1-4 保存温度範囲 Storage temperature range : -40°C to +85°C
2. 構造 Construction
 - 2-1 寸法 Dimensions
資料に準じて図による。
Refer to attached drawing.
3. 定格 Rating
 - 3-1 定格電圧 (SW01) Rating : D.C. 5V 10mA (1mA MIN)

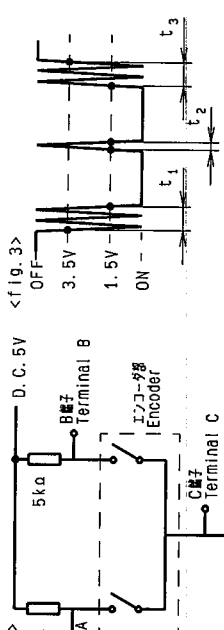
4. 電気的特性 Electrical characteristics (SW01)

項目 Item	条件 Conditions	規格 Specifications
4-1 出力信号 Output signal format		A, B2信号の電圧出力とし、詳細は<Fig. 1>の通りとする。 (詳細はクロック信号の組合せのクロックの位置を示す) 2 Phase-different signals (Signal A, signal B) Details shown in <Fig. 1>. (The broken line shows detent position of with-detent type.)
	回転方向 Shaft rotational direction	信号 Signal
	時計方向 C. W.	A(A-C端子) A(Terminal A-C)
		B(B-C端子) B(Terminal B-C)
	反時計方向 C. C. W.	A(A-C端子) A(Terminal A-C)
		B(B-C端子) B(Terminal B-C)

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APPD.	CHKD.
Mar. 22, '96	Mar. 22, '96
Y. YOSHIOKA	M. SATOH
TITLE 1.1形回転形エンコーダ 11mm Size Rotary Encoder	
DOCUMENT NO. F 7374697M (1/6)	
SYMB	DATE
APPD	CHKD
DATE	DSGD

CLASS NO.	TITLE
	1.1形回転形エンコーダ規格書 11mm Size Rotary Encoder Specification

項目 Item	条件 Conditions	規格 Specifications
4-2 分解能 Resolution	1回転で出力されるパルス数 Number of pulses in 360° rotation.	各相 15パルス/360° 15 pulses/360° for each phase (27パルス/1回転) (27 pulses/1pulse)
4-3 スイッチング特性 Switching characteristics	下記速度範囲<Fig. 2>を用い、回転軸を360°、S'の点を1回転し測定する。 Measurement shall be made under the condition as follows. 1) Shaft rotational speed : 360°·S' 2) Test circuit : <Fig. 2>	



1) チャタリング Chattering	コードOFF-ON及びON-OFFの際の、出力1.5V~3.5Vの過渡時間にて測定する。 Specified by the signal's passage time from 3.5V to 1.5V or from 1.5V to 3.5V of each switching position (code OFF-ON or ON-OFF). $t_1, t_3 \leq 2ms$
2) 振動ノイズ Sliding noise (Bounce)	コードOFFの際の1.5V以上の電圧変動時間とし、チャタリング t_1, t_3 の電圧変動1.5V以上の部分は、別の振動ノイズと判断する。 Specified by the time of voltage change exceed 1.5V in code-OFF area. When the bounce has code-ON time less than 1ms between chattering (t_1 or t_3), the voltage change shall be regarded as a part of chattering. When the code-ON time between 2 bounces is less than 1ms, they are regarded as 1 linked bounce.
3) 振動ノイズ Sliding noise	コードOFFの際の電圧変動 The voltage change in code-OFF area. $t_2 \leq 2ms$ $t_2 \leq 2ms$

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DOCUMENT NO. F 7374697M (2/6)	
SYMB	DATE
APPD	CHKD
DATE	DSGD

CLASS No.	TITLE	11形回転形エンコーダ規格書 11mm Size Rotary Encoder Specification	項目 Item	条件 Conditions	規格 Specifications
4-4	位相差 Phase-difference	360°・S ² の定速度で動作回転する。 Measurement shall be made under the condition which the shaft is rotated in 360°・S ² (constant speed).		<p>注書き事項 動作時点での電子前駆電圧の出力波形は使用されるクォーツ圧、軸の回転速度によって変動します。回路図が仕様書に示されています。 Note: Above specification (4-4) is changeable when operate by manual. Please check performance using actual circuit and knob.</p>	<fig. 4> ΔT±6msec In<fig. 4>
4-5	絶縁抵抗 INSULATION resistance	端子-軸間抵抗C. 250V/1mAの値とする。 Measurement shall be made under the condition which a voltage of 250v.c.1mA is applied between individual terminals and bushing.			端子-軸間抵抗C. 250V/1mAの値とする。 Measurement shall be made under the condition which a voltage of 250v.c.1mA is applied between individual terminals and bushing.
4-6	耐電圧 Dielectric strength	端子-軸間抵抗A.C. 300V/1分間又は、A.C. 360V/2秒間印加する。(リーク電流1mA) A voltage of 300v.A.C. shall be applied for 1min or a voltage of 360v.A.C. shall be applied for 2sec between individual terminals and bushing. (Leak current:1mA)			端子-軸間抵抗A.C. 300V/1分間又は、A.C. 360V/2秒間印加する。(リーク電流1mA) A voltage of 300v.A.C. shall be applied for 1min or a voltage of 360v.A.C. shall be applied for 2sec between individual terminals and bushing. (Leak current:1mA)
5. 機械的性質 Mechanical Characteristics					
5-1	全回転角度 Total rotational angle				規格 Specifications 360°(±10VZ) 360° (Endless)
5-2	フリックトルク Detent torque				12±7mN・m
5-3	フリック数及び位置 Number and position of detents.				30±0フリック 30 detents (ステップ角度 12°±3°) (Step angle:12°±3°)
5-4	端子強度 Terminal strength	端子軸の任意の方向に5Nの静荷重を1分間加える。 A static load of 5N be applied to the tip of terminals for 1minute in any direction.			端子の破損、歪みや欠け等ないこと。 軸の曲りや折れ等ないこと。 軸の過度のゆるみ等ないこと。 Without damage or excessive looseness of terminals. Terminal bend is permitted.
5-5	軸の押し引き強度 Push-pull strength of shaft	軸の押し引き方向に100Nの静荷重を10秒間加える。(トップネット法) Push and pull static load of 100N shall be applied to the shaft in the axial direction for 10s. (After installing)			軸の破損、歪みや欠け等ないこと。 軸の過度のゆるみ等ないこと。 Without damage or excessive play in shaft abnormality in rotational feeling.

ALPS ELECTRIC CO., LTD.

APPD. CHKD. DSGD. TITLE 11形回転形エンコーダ
Mar. 22, '96 Mar. 22, '96 Mar. 22, '96 11mm Size Rotary Encoder
Y. YOSHIOKA M. SATOH Y. ISAWA DOCUMENT NO. F 7374697M (3/6)

CLASS No.	TITLE	11形回転形エンコーダ規格書 11mm Size Rotary Encoder Specification	項目 Item	条件 Conditions	規格 Specifications
5-6	軸突ネジ締付強度 Pushing nut tightening strength	<fig. 5>を満足するよう締付する。 Tighten the nut according to <fig. 5>			1N・m以下で締め付けると。 Tightening torque to be no greater than 1N.m.
5-7	軸ガク Shaft wobble	軸先端から5mmの距離に50mN・mの曲げモーメントを加える。 A momentary load of 50mN.m shall be applied at the point 5mm from the tip of the shaft in a direction perpendicular to the axis of shaft.			軸ガク Wobble (mp-p less) 0.7 X L / 30 Lは軸径より大きい値とする。 L: Measurement point from mounting surface of bushing.
5-8	軸のストローク方向ガク Shaft play in axial direction	軸を固定し測定する。 Measure with jig for rotational angle.			0.4mmD=0.8IT 0.4mmD-p MAX.
5-9	軸の回転方向ガク Rotation play at the click position	7本の「は」は、それぞれ条件「七」を指定する。 Specified by the Clause 7 "Soldering conditions".			5度以内 5 MAX.
5-10	溶接上の注意 Notice for mounting	右側の単位スイッチ本体を挿入して使用して下さい。セット側スイッチ本体の引込及び回転方向の「イト」が異なる場合は、はんだ付けの指定となり、はんだ付けは必ずしも必要ではありません。はんだ付けは必ずしも必要ありません。 Hold the bushing use front panel or light pipe. Because this switch not has thread. If don't hold the bushing, the switch maybe become intermittent or rough mounting after soldering by knob stopper force.			溶接の姿勢、温度のせいなど。 There shall be no deformation or cracks in molded part. No excessive abnormality in rotational feeling.
6. 耐久性能 Endurance Characteristics.					
6-1	シフト軸寿命性能 Rotational life	無負荷で毎時500サイクルの速度で、15,000サイクル毎に検査を行う。 但し、検査中は、0.005mmの中間検査を行う。(1サイクルは、360°(検査) The shaft of encoder shall be rotated to 15,000 cycles at a speed of 500cycles per hour without electrical load. However, an interim measurement shall be made immediately after 5,000 cycles. (1 cycle: rotate 360° CCW rotate 360° CW)			フリックトルク・初期検査値に対し±30% その他、初期検査値を満足すること。 Detent torque: Relative to the previously specified value. ±30% Except above items, specifications in clause 4.1-6 and 4.1.5.3 shall be satisfied.

ALPS ELECTRIC CO., LTD.

APPD. CHKD. DSGD. TITLE 11形回転形エンコーダ
Mar. 22, '96 Mar. 22, '96 Mar. 22, '96 11mm Size Rotary Encoder
Y. YOSHIOKA M. SATOH Y. ISAWA DOCUMENT NO. F 7374697M (4/6)

CLASS No.	TITLE
	1.1形回転形エンコーダ仕様書 11mm Size Rotary Encoder Specification

7. 貼付条件 Soldering conditions (SW01). (SW02)

7-1 手付けの条件 Manual soldering

温度 350°C以下、時間 3秒以内
Bit temperature of soldering iron : 350°C or less.
Application time of soldering iron : within 3s.

7-2 ティップの条件 Dip soldering

使用基板 : t1.6両面銅箔基板
Printed wiring board: Both-sided copper clad laminate board with thickness of 1.6mm.

フラックス : 比重0.82以上のフラックスを用い塗布式テフロンエポキシ樹脂を、基板厚の3分0.2。
Flux:

Specific gravity: 0.82 or more.
Flux shall be applied to the board using a bubble foaming type fluxer.
The board shall be soaked in the flux bubble only to the 2/3 of its thickness.

プリヒート : 基板温度 100°C以下、時間 2分以内
Preheating:
Surface temperature of board: 100°C or less.
Preheating time: within 2 min.

はんだ : 温度 260±5°C、時間 5±1秒
Soldering:
Solder temperature: 260±5°C.
Immersion time: 5±1 sec.

以上の工程を1回または2回繰り返す。
Apply the above soldering process for 1 or 2 times.

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1.1形回転形エンコーダ	
11mm Size Rotary Encoder	
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(5/6)	

CLASS No.	TITLE
	プッシュモーメントスイッチ仕様書 PUSH MOMENTARY SWITCH SPECIFICATION

1. 定格容量 (基準負荷) D. C. 5V 0.1A (500mA MIN)
Switch rating (resistor load)

2. 電力的性能 Electrical characteristics

項目 Item	条件 Conditions	規格 Specifications
2-1 接触抵抗 Contact resistance	D. C. 5V10mA電圧降下法にて測定する。 Measured by the 10mA 5V D.C. voltage drop method.	100mA以下 100mA MAX.
2-2 チャタリング Chattering	1サイクル (OFF-ON-OFF) 1回で動作させる。 Switch is operated at the rate of 1 cycle 1 sec. The 1 cycle shall be OFF-ON-OFF.	10msec以下 Less than 10msec
2-3 絶縁抵抗 Insulation resistance	端子-絶縁面に D. C. 250V1mA印加する。 Measurement shall be made under the condition which a voltage of 250V D.C. 1mA is applied between individual terminals and bushing.	端子-絶縁面間に100kΩ以上 Between individual terminals and bushing: 100kΩ MIN.
2-4 耐電圧 Dielectric strength	端子-絶縁面に A. C. 300V1分間印加し、A. C. 360V2分間印加する。(リーク電流1mA) A voltage of 300VA. C. shall be applied for 1min or a voltage of 360VA. C. shall be applied for 2sec between individual terminals and bushing. (Leak current: 1mA)	絶縁-アーク-破壊電圧がわかれごと。 Without damage to parts arcing or breakdown.

注記:
Note:
軸・スイッチ端子間には絶縁がとられます。
Shaft is insulated from switch terminal.

3. 機械的性能 Mechanical characteristics

項目 Item	条件 Conditions	規格 Specifications
3-1 スイッチ回路・接点接続 Contact arrangement		単極単投 (PUSH ON) S.P.S.T. (Push on)
3-2 スイッチ作動量 Switching stroke		0.5 +0.4 mm
3-3 スイッチ作動力 Switch operation force		613N

4. 耐久性能 Endurance characteristics.

項目 Item	条件 Conditions	規格 Specifications
4-1 寿命特性 Operating life	定格負荷にて毎時5000回の速度で25,000回動作試験を行う。 The shaft of switch shall be 25,000 times at a speed of 500 times per hour without electrical load. However, an interim measurement shall be made immediately after 5,000 times.	接触抵抗: 200mA以下 その他、初期性能を満足すること。 Switch contact resistance: 200mA MAX. Except above items, specifications in clause 2. 2-4 and 3. 1-3 shall be satisfied.

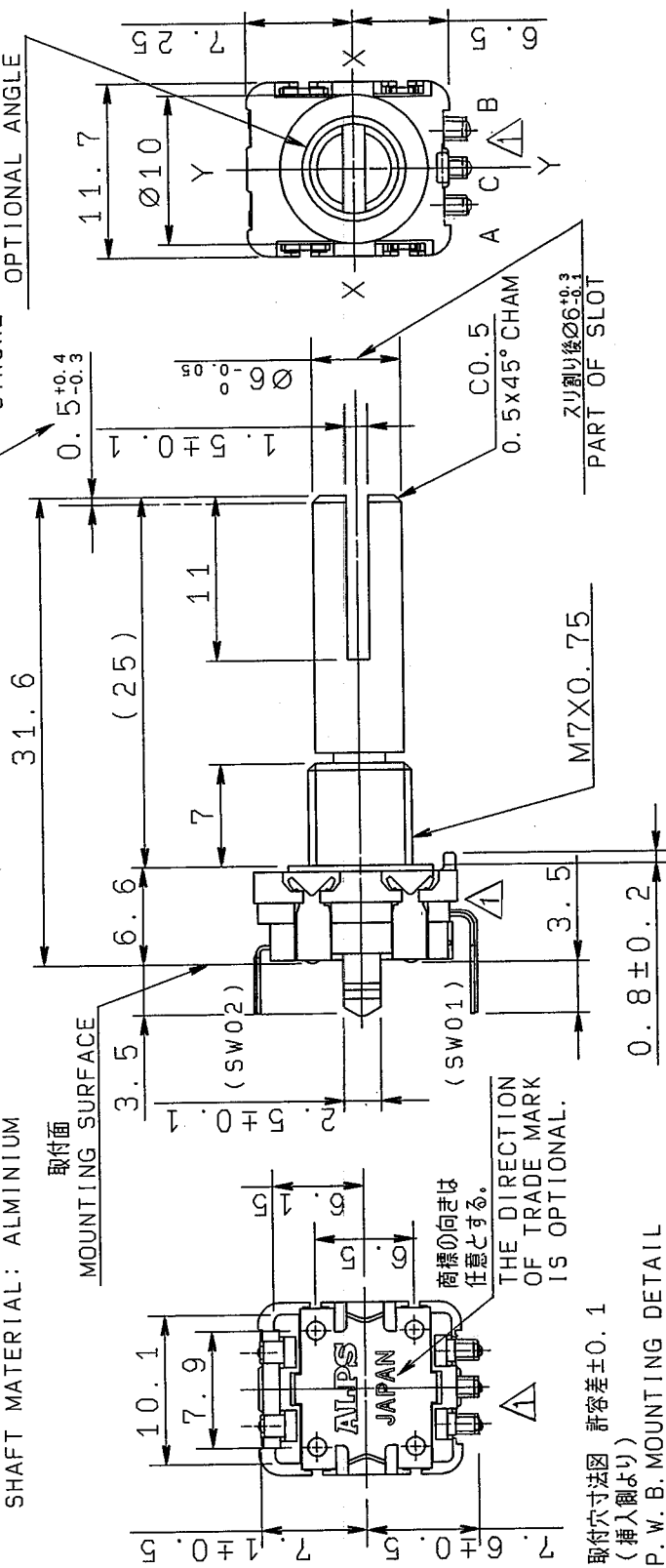
ALPS ELECTRIC CO., LTD.	
SYMB	DATE
APPD	CHKD
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APPD.	CHKD.
Mar. 22. '96	Mar. 22. '96
Y. YOSHIOKA	M. SATOH
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1.1形回転形エンコーダ	
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注記
軸受材質: 亜鉛ダイキャスト
軸材質: アルミニウム

NOTES
BUSHING MATERIAL: ZINC ALLOY DIE CASTING
SHAFT MATERIAL: ALUMINIUM

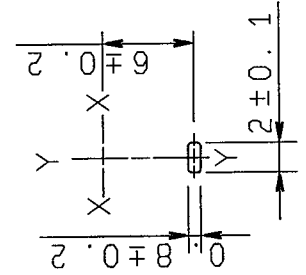
スリ割り角度は任意とする。
SHAFT SLOT IS
OPTIONAL ANGLE

SW 移動量
STROKE

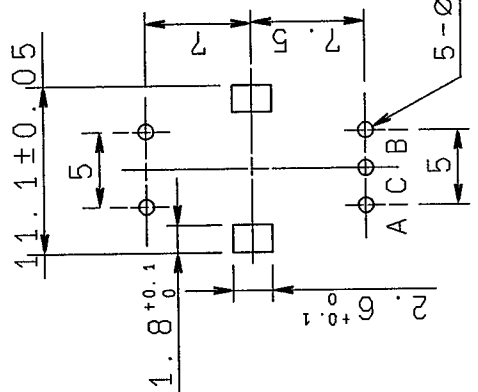


取付寸法図 許容差 ± 0.1
(挿入側より)
P. W. B. MOUNTING DETAIL
TOLERANCE ± 0.1
VIEWED FROM MOUNTING SIDE

シャワー止め詳細図
LOCATING LUG DETAIL



基板厚 t = 1.6mm
P. C. B.



端子基板挿入部形状
TERMINAL DETAIL

指定なき部分の許容差 TOLERANCES UNLESS OTHERWISE SPEC	L ≤ 10	±0.3
	10 < L < 100	±0.5
	100 ≤ L	±0.8
角度 ANGULAR DIMENSION		±5°

PART NO.	NAME	MATERIAL NAME & CODE	FINISH
ALPS ALPS ELECTRIC CO., LTD.			
		UNIT. mm	SCALE
		CHKD.	DSGD.
SYMB	DATE	APPD.	TITLE
3	98-09-18	T.O.K.A.	11形1軸 PUSH ON SW付薄形エンコータ -
DATE	APPD.	CHKD.	DOCUMENT NO.
98.11.16	溝淵	竹沢	LA211446S
			4.6g

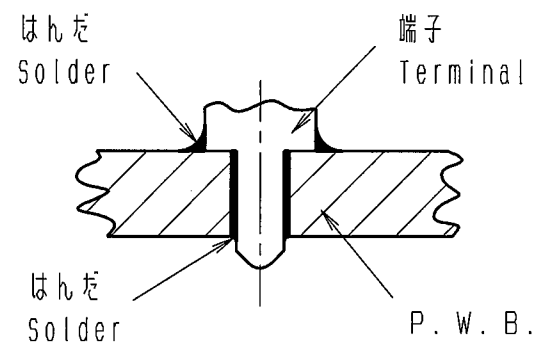
1998. 9. 28
1998. 4. 3

OR

CLASS No.	TITLE
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<はんだ付け時の注意事項>
 Caution for soldering

図のようにP.W.B.の上にはんだ付けをする配線は避け下さい。
 Please avoid soldering on upper surface of P.W.B. as shown



⚠ 基板に挿入される金属足ははんだ付けしてご使用願います。
 Solder all metal inserted fixing including terminals & metal lugs into a substrate.

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△ ₁	09-01-27	Y. K	Y. K	H. M	1996/01/11	1996/01/11	1996/01/11	4 K - 1 (1/1)		
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